THE IRON TRADE REVIEW

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Dullness Depresses Prices

And Lower Quotations Are Made on Nearly All Products from Pig Iron to Scrap

The continuation of dullness in domestic demand and failure of foreign business to develop into orders of appreciable size are having effect on prices. Buffalo pig iron has receded to lower levels, semi-finished materials are weaker, contracts for tin plate at Chicago have been made at very low prices and there is weakness in nearly every product. Wire is almost the only exception to the rule. The capacity of furnaces, steel plants and rolling mills in operation is being reduced.

Pig Iron

The appearance of two textile machinery builders of New England and a few other buyers in the New York pig iron market resulted in more sales than had been made in that district during any week since last July, but the total tonnage was only about 10,000 and the eagerness of furnaces to take the limited amount of business was indicated by the development of lower prices. There has also been some shading on foundry iron at Pittsburgh and very little, if any, southern iron is sold at more than $10 for No. 2 Birmingham. Eastern merchant furnaces at present have on their books unfilled tonnage to keep the plants now in operation busy for the next four months, but the going capacity is much below normal.

Structural Material

Although the volume of structural contracts awarded in September was somewhat larger than for the preceding month, structural conditions are still very unfavorable. It is probable that the tonnage being contracted for is as small as it was during the dull periods of the 90's. At that time, the demand for buildings was not as great as it has been in recent years, but the railroads were ordering larger tonnages than they are today. Financial conditions still prevent the carrying out of numerous building projects.

Prices

During the past few days, a tendency toward weakness in prices of shapes and bars has developed and on anything like desirable business the ruling quotation on these products is 1.15c, Pittsburgh, as it has been for several weeks on plates. In view of the limited demand, this is not surprising; in fact, the recent strength of prices of these three important products has been rather remarkable.

Wire and Pipe

Wire mills are still busy and specifications, especially from jobbers, are satisfactory. Considerable foreign business is being done. Owing to the inactivity in the oil and gas fields, steel pipe mills are operating at only about 50 per cent of capacity. The City of Cleveland has awarded 3,200 tons of cast iron pipe to the leading interest. The demand for cast iron pipe is limited on account of the inability of municipalities to float securities.

Coke and Scrap

Quotations on some grades of scrap are still lower in several districts and there is very little demand. The coke market is very dull and shipments continue to be light. The iron ore movement in the Lake Superior region is so light that many vessels are going out of commission and the shipments for this month will show a sharp decrease compared with last month and with October of last year.

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Analyzing the Labor Sections

IN discussing the provisions of the Clayton bill relating to labor unions, we have expressed the opinion that, as interpreted by the courts, various sections which seem to grant special favors might not be as baneful as some critics of the bill have predicted. In this connection, we are glad to find that we are supported by Daniel Davenport, general counsel for the American Anti-Boycott Association, who has just published an important pamphlet, "An Analysis of the Labor Sections of the Clayton Anti-Trust Bill". On account of his high standing as a constitutional lawyer, and of the study that he has given to laws relating to labor and capital for many years, and because he has accorded special study to the Clayton bill, whose progress through both branches of Congress he has been watching at Washington during the entire session, Mr. Davenport's opinion is entitled to great weight.

Mr. Davenport asserts that the Clayton bill, in the shape in which it finally passed, makes few changes in existing laws relating to labor unions, injunctions and contempts of court, and that those are of slight practical importance. He says that the bill does not change in any respect the Sherman anti-trust act as it has been construed by the Supreme Court. He quotes from reports of the judiciary committees of both the Senate and House in support of his assertion and says that section 6 of the bill is nothing more than a legislative declaration of the law as laid down by the Supreme Court in the case of Adair vs. the United States. Mr. Davenport declares that the bill does not affect the liability of the members of unions for the unlawful acts of their officers and agents, nor does it sanction the existence of such acts or their removal from the condemnation of the civil and criminal provision of the Sherman act, or justify or excuse a conscientious department of justice in neglecting to proceed against such a combination as the American Federation of Labor.

"The whole scheme of the trades commission bill," says Mr. Davenport, "and of most of the Clayton bill, is framed in complete negation of the doctrine that courts of equity cannot issue injunctions except to protect property or property rights so defined, or that they cannot enjoin the commission of acts which are also crimes. Indeed, what has been so long denounced as government by injunction has been enormously extended by these two bills." Mr. Davenport calls attention to sections 21 and 22 of the Clayton bill, which specifically provide for the enforcement of injunctions to forbid acts which are crimes. The fact that the penalties are of unexampled severity may be news to the labor agitators who have not realized the full import of some of the provisions of the Clayton bill. Suits between an employer and his ex-employes who have struck and boycott cases generally are not included in the section prohibiting certain kinds of injunctions.

The opinion of Mr. Davenport will do much toward quieting the fears of employers and will cause labor leaders no little apprehension.

Export Prices

A SUBSCRIBER who has had experience in foreign trade and resided abroad writes as follows in regard to the attitude of American manufacturers at the present time:

EDITOR THE IRON TRADE REVIEW:

From the reports that we get from abroad, apparently there is a mistaken idea in this country as to the needs of England for American-made products similar to those which were formerly imported from the continent.

We sent a recent copy of THE IRON TRADE REVIEW, Sept. 10, to some of our friends in England and we thought the following comment would be particularly interesting. We quote as follows:

> "It looks to me as if there is a great opportunity for American manufacturers to increase their export business not only with England and France, but with the rest of the world, where there has been more or less dependence upon German sources of supply. I think, however, that they must not expect abnormal prices for the goods they have to sell. I note in THE IRON TRADE REVIEW a reference to steel billets, where it says that recent English offers for billets, etc., have not been very attractive to the American makers, and

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little actual selling has been done. Considering that Germany has been the main source of supply for sheets and plates—for instance, all the plates for our steel barrels have come from Germany in the past, also much of the material from which our ships are built—I think American manufacturers are expecting too much when they ask high prices for their products. If they would be satisfied with a normal price, but with a largely increased output, it is all they can expect."

Undoubtedly, the opportunity for doing business in England is there, and is a big one, but it the American manufacturer expects to get any amount of English trade, he will have to go after the business in the same way in which he would handle business in this country. That is, he must expect to meet competition and must expect to comply with the customer's desires in every way that is practical.

From other sources of information which we have, it would appear to us that the manufacturing industry in England is by no means so demoralized as some people would have us think. F. A. C.

We do not presume to say whether the prices named by American manufacturers were too high or not. Under the conditions which have existed since war was declared, it was to be expected that prices somewhat higher than those which would be named under ordinary conditions would be quoted. It is significant, however, that English consumers, although not satisfied with the prices that have been made on billets, are keeping in touch with American makers and are requesting continuation of negotiations. Doubtless, as conditions become more settled, American manufacturers and foreign consumers will come to a better understanding and it is probable that American exports will largely increase.

Increased Use of Steel Pipe

AN ANALYSIS of the figures on the production of iron and steel skelp, used for the manufacture of pipe, contained in special statistical bulletin No. 8, issued by the Bureau of Statistics of the American Iron and Steel Institute, indicates the tremendous growth of the steel pipe industry in the past decade. The figures, which cover the period 1905 to 1913, both inclusive, show that 10 years ago steel pipe constituted 68½ per cent of the total pipe production of the country, while at the present time it constitutes 87½ per cent of the production, showing a gain of 19 per cent as compared with wrought iron pipe in 10 years. These figures are all the more interesting when it is considered that the first steel pipe was not made until 1887; in 27 years the consumption of steel pipe has increased from nothing to practically 90 per cent of the total used in the United States. The figures showing the production of iron and steel skelp in gross tons, together with their relative percentages for nine years are as follows:

Year.	Iron.	Steel.	Total.	Percentage Iron.	Percentage Steel.
1905	452,797	983,198	1,435,995	31-1/2	68-1/2
1906	391,517	1,137,068	1,528,585	25-3/5	74-2/5
1907	444,536	1,358,091	1,802,627	24-2/3	75-1/3
1908	297,049	853,534	1,150,583	25-3/4	74-1/4
1909	370,151	1,663,230	2,033,381	18-1/5	81-4/5
1910	350,578	1,477,616	1,828,194	19-1/4	80-3/4
1911	322,397	1,658,276	1,980,673	16-1/4	83-3/4
1912	327,012	2,119,804	2,446,816	13-1/3	86-2/3
1913	312,746	2,189,218	2,501,964	12-1/2	87-1/2

The popularity of steel pipe is due to a number of causes. Undoubtedly, its economy has been an influential factor, but the great increase in production during the past two decades cannot be attributed to price alone. Quality also has played an important part. The uniform character of well-made steel pipe is a factor in its favor, and its ductility adds to its serviceableness. Samples cut from steel pipe show an elongation in 8 inches of from 18 to 24 per cent, together with an elastic limit of 36,000 pounds to the square inch and a tensile strength, taken in either direction to rolling, of 58,000 pounds per square inch. As far as the subject of corrosion is concerned, without going into exhaustive arguments, it may be said that prominent metallurgists now agree that any special fears which may have been entertained regarding the resistance of steel pipe to corrosion are groundless. It seems, therefore, that there are sound economic reasons behind the tremendous increase in the production of steel pipe during the past 25 years.

Prices Present and Past

Quotations on leading products today, average for last month, average for three months ago and average for October, 1913. Prices are those ruling in the largest percentage of sales at the dates named.

	Today's prices.	Average for Sept., 1914.	Average for July, 1914.	Average for Oct., 1913.
Bessemer pig iron, Pittsburgh..	14.90	$14.90	$14.90	$16.60
Basic pig iron, Pittsburgh.....	13.90	13.90	13.90	14.85
No. 2 Fdy. pig iron, Pittsburgh	13.60	13.90	13.90	14.80
Northern No. 2 Fdy., Chgo....	13.25	13.50	14.00	15.00
Lake Superior Charcoal, Chgo..	16.00	15.75	15.75	15.75
Malleable, Bessemer, Chicago...	13.25	13.50	14.00	15.00
Southern No. 2 Birmingham....	10.00	10.00	10.13	11.00
Southern Ohio No. 2, Ironton..	13.00	13.00	13.50	14.00
Basic, eastern Pa.....	14.00	14.00	14.00	15.25
No. 2X Virginia furnace.....	12.50	12.50	12.50	13.00
No. 2X Foundry, Philadelphia...	14.75	14.75	14.75	15.75
Ferro mang., Balti.....	68.00	90.00	37.50	50.00
Billets, Pbgh. & Ygn.....	21.00	21.00	20.00	23.00
Sheet bars, Pbgh. & Ygn.....	22.00	22.00	21.00	23.80
Steel bars, Pittsburgh.....	1.15	1.20	1.15	1.40
Iron bars, Philadelphia.....	1.20	1.25	1.20	1.37
Steel bars, Chicago.....	1.33	1.38	1.28	1.53
Tank plates, Chicago.....	1.33	1.38	1.28	1.53

	Today's prices.	Average for Sept., 1914.	Average for July, 1914.	Average for Oct., 1913.
Structural shapes, Chicago.....	$1.33	$1.38	$1.28	$1.58
Iron bars, Cleveland, local del'y.	1.20	1.20	1.20	1.37
Iron bars, Chgo. mill.....	1.02½	1.07	1.05	1.25
Beams, Pittsburgh	1.15	1.20	1.15	1.37
Beams, Philadelphia	1.30	1.30	1.25	1.45
Tank plates, Pittsburgh.....	1.15	1.18½	1.12½	1.34
Tank plates, Philadelphia.....	1.30	1.30	1.25	1.55
Sheets, blk., No. 28, Pittsburgh.	2.00	1.95	1.87	2.02
Sheets, blue an., No. 10, Pbgh.	1.40	1.40	1.37	1.56
Sheets, galv., No. 28, Pbgh.....	3.00	2.95	2.80	3.07
Wire nails, Pittsburgh.....	1.60	1.55	1.57	1.62
Connellsville fur. coke., contr...	1.65	1.75	2.00	2.15
Connellsville fdy. coke contr...	2.25	2.25	2.40	2.81
Heavy melting steel, Pbgh.....	10.75	11.44	12.00	12.25
Heavy melting steel, east'n Pa.	10.00	11.00	10.50	11.00
Heavy melting steel, Chgo.....	9.00	9.37	9.50	10.50
No. 1 wrought, eastern Pa.....	11.50	12.50	12.00	14.25
No. 1 wrought, Chgo.....	7.75	8.31	9.00	9.75
Rerolling rails, Chgo.....	10.00	10.87	11.25	12.00
Car wheels, Chgo.....	10.50	10.75	11.00	12.50

(For Additional Prices See Page 742.)

More Pig Iron Buying in the East

But Prices Show Weakness in That Territory and Also in Pittsburgh —Slight Improvement at Cincinnati

New York, Oct. 13.—Buying by two New England textile machinery builders and in scattered cases, by other consumers, has brought more tonnage into the pig iron market in the metropolitan and surrounding territory, the past week than since early in July. The total of these sales, however, has not been heavy, and it has aggregated about 10,000 tons. Softer prices, generally, have accompanied the return to the market of some scales of buying. A Whitinville, Mass., machinery builder closing for about 5,000 tons of foundry iron for this year, bought 3,000 tons of No. 2X at slightly below $15, delivered, and also took 1,000 tons of high phosphorus No. 2X from a Pennsylvania maker at a little above $15, delivered. A Hopedale, Mass., machinery foundry bought 2,000 tons of No. 2X at $15, delivered, another lot of 1,000 tons and other sales in New England for the remainder of the year at $15, delivered, are reported. A price of $15, delivered, New England, is equivalent to $12.45, Buffalo basis. Such a figure is understood to be due to the aggressiveness of certain makers including a western New York furnace with 50 cents freight advantage to New England over Buffalo makers and to one interest in the latter territory, which is reported to have been quoting $12.50, furnace, for No. 2X in some cases. Other Buffalo makers are asking around $12.75, furnace. The tidewater market also has shown price weakness. An Elizabethport, N. J., buyer took about 750 tons of No. 1X and shaded $14.50, delivered, the business going to eastern Pennsylvania. A Paterson, N. J., consumer divided 1,200 tons of No. 1X and No. 2 plain between Buffalo and eastern Pennsylvania furnaces. The lower grade iron went just below $14, delivered, and the No. 1X at a higher figure. The tidewater market now is quoted at $14.25 to $14.50, for No. 2X. A $12.50, Buffalo, price is equivalent to $14.25 to $14.50, at Jersey tidewater points. New inquiry the past week has not kept pace with sales, but several thousand tons remain pending.

Eastern Statistics Favorable.

Philadelphia, Oct. 12.—Eastern merchant pig iron producers collectively remain in a good position on orders booked despite the market dullness of the past month. Aggregate orders now on hand represent about four months' output at the present reduced rate of operations. September statistics as reported at the meeting of the Eastern Pig Iron Association in this city the past week showed a practically stationary condition of stocks and some falling off, though not large, in total orders. In Virginia, a small reduction in stocks was reported. Total stocks in the latter district now are a little less than 150,000 tons. A slight increase in the volume of new business and inquiry was shown in this territory the past week. Most of the business done was for filling in needs for this year, but a few sales for first quarter and first half are reported, upon which some makers state they received 50 cents advance. Pipe makers continue to buy steadily. One Delaware River plant took 1,200 tons of low grade iron at $14, delivered, but certain conditions surrounded this sale since either pipe or mill forge can be had quite readily at $13.50, delivered, eastern Pennsylvania. Another eastern Pennsylvania pipe foundry took 1,000 tons of metal and a Virginia shop of the same class, 500 tons. A Schuylkill valley foundry bought 600 tons of No. 2X and another consumer farther west also 600 tons, from a central Pennsylvania maker at $13, furnace. Small sales of eastern Pennsylvania No. 2X are being made around $14.75, Philadelphia. Reduced freight rates on Virginia iron of $2.75 to Philadelphia and of $2.25 to Baltimore go

(*For complete prices see page* 742.)

into effect this week and these are expected to strengthen the competitive position of this iron, especially in the latter district. A Philadelphia buyer took 300 tons of prompt lake malleable at $15.25, delivered, and a small lot of special basic at $14.50, delivered. Steel making grades are slow. Basic is wholly inactive. An eastern Pennsylvania steel maker bought a small tonnage of standard low phosphorus and Lebanon makers booked several thousand tons in the week in mixed lots. Low phosphorus prices are unchanged as quoted.

Market Dull at Buffalo

Buffalo, Oct. 13.—Little placement is recorded in the Buffalo district, although orders amounting to a small total tonnage have been taken from New England melters, at prices of $12.50 to $13.50, f. o. b. furnaces, covering the range of low silicon irons up to the higher grades. A small amount of higher silicon iron has been placed at $14.00, but not enough to determine the market, as all prices at this time are but nominal. Consumers report that inquiries coming into the foundries of the district are of sporadic character, as plants, for the most part, are being operated with either reduced forces or on part time. The average for the melters in operation at the present time is about a 40 to 50 per cent basis. There are some plants engaged to such extent that their operation lends a note of optimism to the situation. Specifications against contracts continue to come in in fair volume to the furnaces.

The Fillmore Avenue Foundry & Iron Works, Buffalo, through Lymann P. Hubbell, president, announces securing a contract for high grade gray castings amounting to $100,000, with additional business pending.

Foundry Offered at $12.75

Pittsburgh, Oct. 13.—Nearby blast furnaces have offered foundry pig iron at a price equivalent to $12.75, valley, and reports are heard, both at this center and in northern Ohio, that at least one maker in the valleys has offered to sell at that figure in order to move stocks. So far as can be ascertained, no tonnages of importance have been sold recently, and all quotations are regarded as nominal. Steel making grades are quiet, but prevailing prices appear representative.

Foundries Well Supplied

Cleveland, Oct. 13.—Foundries in the Cleveland district are operating at about 50 per cent of capacity, the light foundries being busier than the plants making heavy castings. Foundries are, as a rule, covered for their requirements at least to Jan. 1 and it is probable that considerable tonnages will run over into the first quarter of next year. Hence it is not expected that there will be any buying of consequence prior to Jan. 1. A few sales of low phos are being made in the central west at current quotations, $21.15 to $21.40, Pittsburgh.

Slight Improvement Noticed

Cincinnati, Oct. 13.—A few sales have been made during the past week which has given a little encouragement to the market, but conditions are still very quiet and stagnant. A local dealer has sold 4,500 tons of foundry iron in this territory divided into two lots, one of 2,000 tons and the other of 2,500 tons. Other sales are mostly for carload lots or for a few hundred tons which, although hardly noticed in the market, have aggregated a little more within the past seven days than during the week previous. It is also reported that sales aggregating several thousand tons have also been made in surrounding territories by branch offices of local houses.

Rumors of lower priced iron are being heard, but they are unfounded as far as can be learned and the minimum price in either Alabama or Tennessee is $10, Birmingham basis, for No. 2 foundry for the last quarter, and furnaces in both states are generally asking from $10.25 to $10.50 for this grade. Southern Ohio No. 2 foundry and malleable iron is being quoted at $13, Ironton basis.

Still Dull at Chicago

Chicago, Oct. 13.—No essential change has taken place in the situation as to pig iron in the west, inquiry being almost absent and makers are unable to prevail upon melters to take tonnage represented on their order books.

Indications point to further curtailment in blast furnace activity and rumors which seem credible are that one of the Iroquois stacks at South Chicago will be put out of blast toward the end of this month. This will leave only three stacks active of the 12 merchant furnaces adjacent to Chicago. One steel stack at the Joliet works of the Illinois Steel Co. has been blown out recently.

In the absence of inquiry and with practically no sales, prices are pegged at approximately $13.50, Chicago furnace, for No. 2 foundry and malleable, with shading in some instances on particularly favorable business. Stocks in the hands of makers are uncomfortably large and although they are covered largely by orders on furnace books, it seems impossible to move the iron.

Southern iron is obtainable without difficulty on a basis of $10, Birmingham, with a minimum of sales and shipments.

Car Lot Sales Rule

St. Louis, Oct. 13.—Car lot sales of pig iron are the ruling features of the market at St. Louis; no large inquiries are out, and local sales agents declare they only hope for better times without any prospects in sight. Southern No. 2 pig iron is quoted at $10 to $10.25, Birmingham basis; Northern iron at $13, Ironton, and $13.50, Chicago furnace.

Plenty of Ten-Dollar Iron

Birmingham, Ala., Oct. 12.—The pig iron market in the Birmingham district has been without developments during the past week. Scarcely any business is being done, it is said. Plenty of iron can be bought here for $10 for No. 2 Southern, but some of the makers are giving out quotations of $10.25 and $10.50. With but one or two exceptions, no furnaces have closed down and stocks in Birmingham yards are said to be heavier than ever in the history of the district. The Ensley rail mills are expected to resume operations during the week, but it is known the resumption will not be permanent. The mill has some few orders, but they are being held up by the buyers.

(For complete prices see page 742.)

Low Price

Made on Tin Plate at Chicago—Will Give Quick Delivery

Chicago, Oct. 13.—The Chicago packing concern which recently placed an order for about 60,000 base size boxes of tin plate with a maker on the Ohio river at $3.10 per box will deliver all of the order by the end of October. The same buyer is inquiring for 6,000 more base size boxes and it is believed the entire quantity is to be made into containers for export food products.

Reports of Shading

Pittsburgh, Oct. 13.—More important makers of tin plate are asking $3.40 and above for base size boxes for prompt delivery, but absence of buying makes it difficult to determine the exact status of the market. Some makers are quoting $3.50, but reports of material selling at less than the published minimum price are heard.

The Asbestos Protected Metal Co., Beaver Falls, Pa., announces the removal of its Buffalo office to 918 Mutual Life building with H. W. Littlefield as district sales manager.

Billet Inquiry

For Foreign Countries—Lower Prices in Domestic Market

Philadelphia, Oct. 12.—A number of negotiations continue to be initiated with eastern sellers of semi-finished steel by foreign buyers. Inquiries received the past week include lots of 2,000 tons, 1,000 tons and smaller quantities of billets for Great Britain and 500 tons for Lisbon, Portugal. Italy has been making some general inquiry for prices. Quotations on some previous foreign lots by eastern makers still are outstanding. Foreign buyers, while usually informing sellers in this territory that these prices are too high, are encouraging them to continue to bid for this business, indicating that they are counting upon this country eventually to furnish them a considerable part of their needs.

The domestic market on billets continues very quiet. One maker who received two round lot inquiries a week ago, reports these matters still are pending. Prices are a little easier and $22.40, Philadelphia, or $20, Pittsburgh, more generally represents the market for rolling steel. For forging billets, $25.40 to $26.40, Philadelphia, is being done and sales of about 500 tons at these figures are reported.

Lower at Cleveland

Cleveland, Oct. 13.—Quotations on semi-finished material are lower in the Cleveland district. A sale of a carload of forging billets was made at $23, Cleveland. On open-hearth and Bessemer rerolling billets, $20, Pittsburgh, is the usual quotation, but a sale at $19.50 is reported.

Quiet at Ashland

Ashland, Ky., Oct. 12.—Billets and wire rods are holding at $21 for the former and $26 for the latter, both Ashland basis, although conditions are quiet and orders are below the capacity of the mills. The outlook for future business is good, as present contracts have not been renewed to any extent recently, and new orders must necessarily result when these expire.

Sheet Bar Price Questioned

Pittsburgh, Oct. 13.—Although more important consumers are under cover for the remainder of the year, it is understood some sheet bar tonnage has been offered at slightly less than the current quotation, but trace of actual sales at concessions cannot be found. On the other hand, one of the leading sheet bar makers has sold a couple of small lots at $22, mill. Demand for billets is comparatively light and prices are untested. Sheet bar inquiry for export shipment continues satisfactory, but no reports of sales are being made. Wire rods also are in demand for shipment to foreign countries. Rods are named at $26, Pittsburgh.

Ship Plates

Booked for Export, But Foreign Orders Develop Slowly

Philadelphia, Oct. 12.—A small lot of ship plates for export was taken in the week by an eastern Pennsylvania producer, but not many orders are resulting from a continued inquiry from abroad. In the domestic market, business is poor, though spasmodic, some weeks showing up better than others. Railroad tonnage is very small. The plate mill of the Alan Wood Iron & Steel Co., which operated last week, is down this week. Eastern plate makers are showing interest in the 6,000 ton requirement of the New York Shipbuilding Co., for the battleship upon which it is low bidder. In price, 1.30c, Philadelphia, or 1.15c, Pittsburgh, is easy on a lot of any size and the indications are lower might be done on an especially attractive order.

Plates Gain No Strength

Chicago, Oct. 13.—Plates continue to be weak and prices range from 1.33c to 1.38c, Chicago, with so little business moving that no incentive is offered to make lower quotations. Car building is practically at a standstill and only two inquiries are before the market at present. One is by the N. C. & St. L. for 1,000 box cars, contingent on ability to finance, and the other is by the Northern Pacific, asking material for 1,000 steel underframes. The latter is expected to develop into business, but the former is problematical. The contingent order by the C., H. & D. has not come to the point of contracting, as financing has not been completed.

Nuts, Bolts and Rivets

Pittsburgh, Oct. 13.—Quotations on nuts, bolts and rivets continue weak and irregular; they are so uncertain, in fact, that it is difficult to indicate the position of the market. Demand is light, and some makers are not running shops at even 50 per cent capacity.

The plant of the Irving Steel Forge Co., Irving, Pa., has renewed operations after a five-months' shut-down.

(*For complete prices see page* 742.)

Ferro Market

Shows No Life—All Anxiety as to Supply Has Disappeared

New York, Oct. 13.—A dull condition of the ferro-manganese market continues. Inquiries and sales almost entirely are lacking. Several leading agents for English makers report not having made a single sale at the new price of $68, seaboard. The trade, apparently, has lost any anxiety it may still have had regarding early supplies, because of the rapid reduction of prices announced by English makers. There appears to be the expectation among buyers that a further reduction is likely, and this attitude is discouraging any further purchasing at this time. Shipments from England continue to come forward steadily.

Some foreign demand for American fluor-spar recently has appeared in the market and sellers in this territory have converted some of this into orders. Some inquiry now is current, including a lot of about 500 tons.

Alloys Show No Life

Pittsburgh, Oct. 13.—Consumers of ferro-manganese at this center are under cover for the remainder of the year, and show no interest in first or second quarter needs. The Carnegie Steel Co. is not offering material in the open market, and has no circular price. The American Manganese Mfg. Co. has not yet blown in its stack at Dunbar, Pa., where ferro-manganese will be made from domestic ores unless present plans are changed.

Pipe Mills at Fifty Per Cent

Pittsburgh, Oct. 13.—Inactivity in the oil and gas fields and the European war, which summarily cut off shipments of tubular goods to countries involved have caused a depressed condition in the market for wrought iron and steel pipe. Mills are not operating at more than 50 per cent capacity, and some are running at considerably less. Demand is light and specifications against old contracts are not satisfactory. Discounts, makers report, are being maintained. Boiler tube makers are complaining about continued inactivity. As noted elsewhere in THE IRON TRADE REVIEW, the National Tube Co. has closed its boiler tube mill at Syracuse, N. Y.

The Superior Wire Products Co., DeKalb, Ill., has increased its capital stock from $8,000 to $15,000.

Next Year Bars

Are Being Contracted for in Eastern District

Philadelphia, Oct. 12.—Some contracting in steel bars for first half or first quarter on the basis of 1.40c, Philadelphia, or 1.25c, Pittsburgh, continues to be put through. A further lot of 1,500 tons was taken in this territory at this figure the past week. Prompt bar prices remain less firm and 1.30c, Philadelphia, or 1.15c, Pittsburgh, can be done on a desirable order, though on the usual run of the market $1 higher is quoted and usually obtained. Specifications are more sluggish. About 200 tons of re-enforcing bars for a sewage disposal plant at Plainfield, N. J., are in the market.

Not Urging Contracting

New York, Oct. 13.—Steel bar makers are not encouraging consumers to enter into first quarter or first half contracts at this time. Where quotations for such delivery have been asked, however, they have named 1.25c, Pittsburgh, or 1.41c, New York. Current specifications represent the principal activity of the market at this time. Operations with some of the larger buyers of steel bars in this district are reported to have shown some betterment the past week. In the absence of any buying, prompt bars are nominally quoted at 1.20c, Pittsburgh, or 1.36c, New York. An attractive order probably could bring a lower price.

Iron Bars are Lower

Chicago, Oct. 13.—Although no decided change has taken place in the demand for bar iron, prices in this market range lower than last week and sales are being made openly at 1.02½c to 1.07½c. This is 50 cents per ton lower than the quotation current last week and attractive tonnages, it is believed, can command an even 1c. The leading maker of iron bars continues to operate its mill steadily although no contracts are held for other than immediate delivery and business is strictly from hand to mouth.

Steel Bars are Slow

Chicago, Oct. 13.—Business in steel bars in Chicago is decidedly slow, as agricultural implement makers, usually depended upon at this time of the year to assist material in the demand, are taking much less than the normal tonnage. These manufacturers have been liquidating severely during the present year and appear to be taking an ultra-conservative stand at present, making up a much less extensive stock than usual. This attitude is reflected in their lessened specifications for steel material and this factor affects the market to a considerable degree. Leading sellers of steel bars continue to ask 1.38c, Chicago, and some business is being taken at this figure. Most attractive tonnages have been able to command 1.33c Chicago, and some immediate specifications for local delivery have met sufficient competition to obtain a quotation of 1.30c, Chicago. However, the latter quotation is not available beyond the city.

Plant Idle in Part

Cleveland, Oct. 13.—The dullness of the bar market in the Cleveland district is reflected by the decreased activity of the plant of the Upson Nut Co. Last week, the open-hearth plant was idle and the bar mill was in operation. This week the open-hearth plant is operating, as is also the blooming mill, but the bar mill is idle. The iron mills are running intermittently and the demand is extremely light. The automobile business is showing signs of improvement, but this is about the only manufacturing industry concerning which this can be said.

Hoops, Bands and Shafting

Pittsburgh, Oct. 13.—Hoops, bands and cold rolled shafting are dull and inactive. Weakness displayed by steel bars the last fortnight has affected the market for bands, which appears quotable at a range from 1.15c to 1.20c. Hoops are named at a spread from 1.25c to 1.30c. Cold rolled shafting is nominally listed at 66 per cent off list. Heaviest consumers are under cover for the remainder of the year.

Sheet Demand

Holds Up in Eastern Pennsylvania—Orders From Many Sources

Philadelphia, Oct. 12.—The sheet trade still holds its own in eastern Pennsylvania. Mills in this district still are booking up to capacity. One maker reports having accumulated some tonnage over the present full rate of output. Orders usually are very numerous and are from many different sources. Everywhere there remains evidence of low stocks. Both light and heavy sheets are in good demand. Prices seem a little easier. While 1.45c, Pittsburgh, or 1.60c, Philadelphia, for No. 10 gage blue annealed is commonly quoted, reports of 1.40c, Pittsburgh, are current.

Some Foreign Inquiry

Pittsburgh, Oct. 13.—The market for steel sheets in western Pennsylvania and eastern Ohio shows no change in position. Specifications are not so heavy as 30 or 60 days ago, and new orders are light. Leading makers continue to name galvanized and black sheets at 3c and 2c, respectively, for base size gages. Inquiries continue to come out for foreign shipment, but no sales of importance have been made for export in the open market, have been made by buyers to obtain a line on prices for 1915 delivery, but manufacturers are declining to sell beyond the close of the present season.

Business Holding

Cincinnati, Oct. 12.—Business is holding at about the same level as last week, being only fairly satisfactory. Buyers are making strenuous efforts to reduce prices, but mills in this vicinity are holding firmly at 2.15c for black sheets No. 28 gage, 3.15c for galvanized No. 28 gage, and 1.60c for blue annealed No. 10 gage, all Cincinnati basis. Rumors are frequently being started that prices had declined, but it is evident that sales are all being made at the above quotations. Judging from reports, mills in this territory are booking 70 to 75 per cent of capacities each week.

Sheets Retain Strength

Chicago, Oct. 13.—Sheets continue to retain more strength than other finished steel products and are firm with quotations of 2.18c and 3.18c, Chicago, for No. 28 gage black and galvanized respectively. If any weakness is developing, it is on the galvanized variety, as black is firm at this mark. Some evidence exists of shading on galvanized and as low as 3.08c, Chicago, is heard. Mills are booked ahead further for sheets than on any other product and rolling schedules are much more steady.

Weakness in Buffalo Iron

New York, Oct. 14. (By wire.)—Further weakness has been shown by Buffalo iron in this district, where competition between these makers and eastern Pennsylvania furnaces continues to depress the market. A Jersey consumer was quoted No. 1X Buffalo iron at only slightly above $14, delivered, equivalent to less than $12.50, furnace. The Buffalo 2X market now seems more squarely around $12.50 for outside shipment. A Brooklyn buyer asks for 600 tons of foundry iron.

(*For complete prices see page 742.*)

Scrap Market Very Weak

New Low Figure on Heavy Melting Steel in New York—Many Requests to Postpone Shipments at Philadelphia

New York, Oct. 13.—The old material market in this territory has flattened out considerably and very little business is being done. Prices are weak and heavy, but in several cases are nominal, because dealers and brokers cannot get the material with which to do business at the offers being made by buyers. Heavy melting steel was sold today in moderate lots at a new low figure of $10, delivered. No. 1 railroad wrought from the recent railroad lists, went at $11.50, delivered eastern Pennsylvania. A lot of car wheels is being offered in the market at $9.60, Jersey point. Some sales of borings, to come from New York state, has been made to western Pennsylvania steel works, at $8.50, delivered. Leading buyers of heavy cast are offering only around $11, delivered Jersey points.

Scrap Shipments Held Up.

Philadelphia, Oct. 12.—Requests by consumers for the holding up of deliveries of heavy melting steel, low phosphorus and other grades are more numerous and these are having an unfavorable effect on the already weak market. New business is very light. A number of consumers take the position that they are not interested in scrap, regardless of price. The Pennsylvania and other eastern railroad lists for September went at prices 25 to 50 cents lower than the previous month. The market hears the report that a Baltimore dealer has purchased 20,000 tons of Panama scrap and intends to bring it into the eastern market, several boats having been chartered for this purpose, as recently stated.

Scrap for Horseshoes

Buffalo, Oct. 13.—The market is devoid of much trading and lacks even a tone, with the possible exception of cast scrap and wrought scrap. A considerable tonnage of the latter has been sold in the Buffalo market to an Erie, Pa., user who has secured a large order for horseshoes, for shipment to Europe. The price situation remains as quoted last week.

No Up-Turn in Scrap

Pittsburgh, Oct. 13.—More important iron and steel scrap dealers at this center are refusing to sell heavy melting material at less than $11, and some are declining to shade $11.25, but those figures appear to be out of the question at present. The last sale of importance was at $10.75. The market is quiet, and no signs of strength are reflected.

Lower Cleveland Prices

Cleveland, Oct. 14.—Lower prices in the Cleveland market for old material have loosened up the situation considerably and a fair amount of scrap is moving. Each successive week for a month has witnessed a decline in the price of heavy melting steel; this week brings the quotation down to $9 to $9.50, the record low level recorded last November. Old busheling is quoted slightly lower, at $8 to $8.50. Stocks in yards and on track are extremely large, exerting a depressing effect on prices. Heavy steel in the valleys is also weaker, being quoted $10 to $10.25.

Depressing Report

Cincinnati, Oct. 12.—The report that one large rolling mill in this vicinity is contemplating shutting down again gives scrap conditions a setback, as rolling mills are the largest users of scrap here and they are already overstocked with old materials. Dealers have long since disregarded a general level of prices and are quoting independently of each other on each sale.

Railroad Lists

St. Louis, Oct. 13.—The scrap iron market is weak and dull at St. Louis. Dealers are well stocked and there is no trading. The mills are not buying. Many grades have declined 50 cents a ton. Lists out today by the railroads are: Big Four, 2,000 tons; Chicago, St. Paul & Minneapolis, 2,100 tons; Northern Pacific, 1,500 tons; Southern, 6,000 tons; Vandalia, 500 tons; M., K. & T., 4,000 tons.

Scrap is Weaker

Chicago, Oct. 14.—Conditions in the iron and steel scrap market are unchanged, with comparatively little material moving from dealers to consumers and railroads offering large quantities, which further depress the market. Liquidation by dealers who find they cannot hold their accumulations longer is the cause of prices being uncertain and while no actual decrease from last week's quotations is registered, the whole line probably is on a somewhat lower plane.

The Union Pacific railway has a list out offering 2,000 tons; the Chicago & Alton offers 1,200 tons, the C., St. P., M. & O. 2,000 tons, the Southern railway 5,500 tons, the Northern Pacific 1,400 tons and the Queen & Crescent 350 tons. In the Southern railway's list are included 650 tons of No. 1 wrought and 250 tons of No. 2 wrought.

(*For complete prices see page* 742.)

Cuban Ore

Is Coming in Slowly—Light Lake Superior Shipments

New York, Oct. 13.—Shipments of Cuban iron ore now are coming in slowly, because of the reduced operations of the Pennsylvania and Bethlehem Steel companies. The Spanish-American Iron Co., the subsidiary of the Pennsylvania Steel Co., now is delivering about 40,000 tons monthly, which is less than half its normal capacity. The Juragua Iron Co., of the Bethlehem Steel Co., also is shipping only occasional cargoes at present, having reduced greatly its mining operations, as reported recently. The properties of the Ponupo Manganese Co. at Nima Nima remain idle, though this company is shipping in odd cargoes to fulfill the old orders. Eastern consumers continue to buy practically no ore at present.

Will End Tamely

Cleveland, Oct. 14.—The Pittsburgh Steamship Co. is now retiring its barges and expects to have them in winter quarters within the next ten days. Some shippers have already retired a part of their fleet and others have scarcely half dozen more cargoes to carry. Practically all of the shippers will be through by the end of October and very little ore will be moved during November. As the support of the other trades, namely coal and grain, is very poor, vessels are steadily going into ordinary and the season will end very tamely. The season's movement of ore will be approximately 32,000,000 tons.

Scrap Dealers' Meeting

Chicago, Oct. 13.—The Western Scrap Iron and Steel Association will hold its regular meeting Tuesday evening, Oct. 20, at the Hotel La Salle, in this city. Formation of the central division at Cleveland recently will be reported on and arrangements will be discussed for the first annual banquet, which will be held Jan. 19.

Structural Steel Contracts

Increased Slightly Last Month—Newark Job, Held Up By Bankers, Will Be Executed

New York, Oct. 13.—Structural steel contracts in the country during September increased slightly over August, but they still are much below normal. Such a condition of trade was shown by the monthly report of the Bridge Builders' and Structural Society, at the monthly meeting, held at New York, Oct. 9, which showed total bookings during September of 38½ per cent of the capacity of the bridge and structural shops of the country. This compares with 27½ per cent in July; 68 per cent in July; 56½ per cent in June; 57 per cent in May; 76 per cent in March, and 88 per cent in April. The structural market in the metropolitan and contiguous territory shows no improvement. New work remains comparatively small. Financing of projects still is an effective obstacle, apparently, to much activity, but work now has been ordered to proceed on about 3,600 tons of the large terminal station of the Public Service Corporation at Newark, N. J., a 9,000-ton job, which was held up several weeks ago by the bankers. Fabricators are competing keenly for business and low prices are shown. The Cambria Steel Co., with a bid of 2.20c, per pound erected, was low on a 150-ton post office for the Central railroad of New Jersey at Communipaw, N. J. The other bids ranged up to 3.90c per pound, erected. Apartment house construction in the greater city now is going at $50 per ton, erected, and loft buildings at several dollars less. Leading fabricators report that they have little doubt they could develop 1.26c, New York, or 1.10c, Pittsburgh, on an attractive tonnage, though the open market remains 1.31c, New York, or 1.15c, Pittsburgh.

Small Orders More Numerous.

Philadelphia, Oct. 12.—The number of small lots of shapes coming on the market is larger, but the aggregate tonnage is so small that there is no perceptible effect upon the mill situation. Large orders are very few. Eastern makers continue to run upon old business and have about 50 per cent of their normal capacity engaged. Prices are subject to question, but it is certain 1.30c, Philadelphia, or 1.15c, Pittsburgh, may be done without much trouble, where the order is desirable. A lower price is not improbable under present conditions. The Carnegie Steel Co. is expected to receive 450 tons of steel sheet piling for Atlantic City water works construction.

Buffalo Lockout

Buffalo, Oct. 13.—Fabricators of the Buffalo district say business is becoming quiet with them. Development work in sight at present requiring steel, represents only limited tonnage jobs.

The situation is made the harder because a lock-out on the part of contractors of Buffalo, identified with the Builders' Exchange. Practically all of the new construction work of size, using steel, is idle at present. The employers have decided to take a stand on the open-shop issue, determining to put it in force in this district, because of demands made by the trades' unions.

Fabricators Not Busy

Pittsburgh, Oct. 13.—Nothing of importance has developed this week in the market for structural shapes and plates. Fabricating shops are in need of additional tonnages, which accounts for some of the low prices recently made on structural undertakings. Interest is taken in the new Schenley high school, this city; about 1,200 tons of steel will be involved.

Keen Competition

Cleveland, Oct. 13.—That competition on structural jobs is still very keen was shown by the bids made for the Ames building, on which it is said that some very low proposals were made. The general contract was awarded to Roy Black, and the steel, 720 tons, will be fabricated by the McMyler-Interstate Co., Bedford, O.

Shapes Still Quiet

Chicago, Oct. 13.—Structural lettings in this district the past week aggregate about 200 tons, the largest item being for the state building in Chicago, 1,200 tons, which was let to the American Bridge Co. Comparative slowness exists in the market for shapes and quotations of 1.33c to 1.38c, Chicago, are being made with some strictly local business for immediate delivery available at 1.30c.

CONTRACTS PENDING.

Steel work at New London, Conn., 400 to 500 tons for New York, New Haven & Hartford railroad; bids entered.

Essex Power Station, Newark, N. J., for Public Service Corporation, 5,000 tons; revised bids entered.

Apartment house for Edw. A. Levy, Sixty-first street and Park avenue, New York City, 1,000 tons, bids about to be taken.

Apartment house for Jacob Axelrod, at Forty-ninth street and Riverside Drive, New York City; tonnage indefinite; plans being prepared.

Schenley high school building, Pittsburgh, 1,200 tons.

CONTRACTS AWARDED.

The State building, Chicago, 1,200 tons, to American Bridge Co.

Buildings for State hospital, Alton, Ill., 473 tons.

Missouri Pacific Railway Co., viaduct, Atchison, Kans., 228 tons, to Morava Construction Co.

New Grand Trunk station, Black Rock, Buffalo, 150 tons steel, to Progressive Steel Co., Buffalo.

Ames building, Cleveland, 720 tons; to McMyler-Interstate Co., Bedford, O.; Roy Black, Cleveland, general contractor.

Viaduct for the Southern railway over the Tye river, Georgia, 950 tons, awarded Pennsylvania Steel Co.

Addition to plant of New Process Gear Corporation, Syracuse, N. Y., 200 tons, awarded Lackawanna Bridge Co.

Building at Olean, N. Y., 300 tons, awarded Syracuse Bridge Co. by general contractor, The Geo. A. Fuller Co.

Steel sheet piling for sewer construction, Atlantic City, 450 tons, placed with Carnegie Steel Co.

Building for Park & Tilford, Madison avenue and Forty-sixth street, New York City, 150 tons, awarded Geo. J. Schnatz Iron Works.

School building at West Hoboken, N. J., 300 tons, awarded Dover Boiler Works.

Elks Club, Utica, N. Y., 150 tons, awarded Utica Steam Engine & Boiler Works.

Orthopaedic Hospital, 420 East Fifty-ninth street, New York City, 700 tons, awarded to Eidlitz & Ross.

Section No. 1 of the Park place, Williams and Clark streets subway connection, New York City, 2,775 tons, F. L. Cranford, Inc., low bidder.

Section No. 1 of the Seventh-Lexington avenues subway line, and section No. 1 of the Steinway tunnel connection, New York City, 5,860 tons; general contract awarded Rapid Transit Construction Co.

(*For complete prices see page* 742.)

Hodell Elected President

H. H. Hodell has been elected president of the Van Dorn & Dutton Co., Cleveland, manufacturer of automobile, machinery and mill gearing and gears and pinions for electric railway and mill motors, to succeed the late James H. Van Dorn. Mr. Hodell, who is president of the Cleveland Galvanizing Works Co. and is interested in several other Cleveland enterprises, was one of the founders of the Van Dorn company and has held the office of vice president for many years. T. B. Van Dorn, president of the Van Dorn Iron Works Co., Cleveland, was chosen to succeed Mr. Hodell as vice president. The active conduct of the company's affairs remains unchanged, under the direction of F. W. Sinram, secretary and treasurer, and Franklin Schneider, manager and chief engineer.

Foreign Car Inquiry

Is Being Received—Rail Market Shows a Little More Life, But Tonnage is Light

New York, Oct. 13.—Car builders in this country have been receiving some inquiries from foreign countries, but few of these matters are in such a form as to promise important results. One of these matters referred to Greece. At this time, however, this inquiry is more a matter of the future than of the present. Some builders now are figuring upon a number of cars of light type for Chile. In addition, the Chile Exploration Co. still has open a lot of 40 cars and the Bethlehem Steel Co. 50 cars, for Chile, which originally were inquired for some time ago. Russia is reported in the market for a number of locomotives. Demand for new equipment by domestic railroads remains lifeless and is expected to continue so largely until the transportation companies are able to market their securities to better advantage than at present.

Rail Market

The rail market continues to show a little more activity, after the dullness of the past several months. Some of the roads are beginning to give attention to their 1915 requirements. In some cases, the roads, to help out certain mills which have been in rather sore straits for specifications, have allowed the rolling of some tonnage in anticipation of formal orders to be placed later. The recent order for 13,000 tons of the Delaware, Lackawanna & Western railroad represents the next year requirements of that road. The New York Central system has released some tonnage for next year in advance of a formal distribution to be made later. The Southern Pacific, which recently purchased 15,000 tons, as reported previously, is expected to place more tonnage a little later, as it had figured originally on 45,000 tons. The Southern railway has closed for 5,000 to 6,000 tons with two makers, the bulk of which will be rolled by the Pennsylvania Steel Co. The United States government is in the market for 500 tons of 90, 125 and 135-pound rails, and for 500 steel ties for Panama. An inquiry for 1,000 tons of girder rails is pending at New York. Frog and switch track work, which has been very dull lately, has been in better demand in small orders during the past week. The rail mill and Bessemer department of the Maryland Steel Co., at Sparrows Point continues to run single turn, on the order for the Queensland, Australian, government. These rails are specified to run 0.06 and below in phosphorus.

Cast Iron Pipe

Is in Limited Demand—City of Cleveland Makes Award

New York, Oct. 13.—Large buyers of cast iron pipe in this territory are hesitating for financial reasons and little tonnage is coming out from the municipalities for the same or other cause. The result is the market is very quiet and where any desirable order appears, a low price is made by some foundry. Export business is not producing any important results and though a number of inquiries are in the market, these are not coming to a head. Asbury Park, N. J., is about to enter the market for 1,000 tons of 24-inch. R. D. Wood & Co. took 200 tons of 8-inch for the City of Brooklyn at $19.09, delivered, and also 670 tons of mixed sizes for Plainfield, N. J.

Cleveland Purchase

Cleveland, Oct. 13.—The City of Cleveland has awarded 3,245 tons of cast iron pipe to the United States Cast Iron Pipe & Foundry Co., and 228 tons of special castings to the Bowler Foundry Co., Cleveland. The United States company bid $21.50, f. o. b. cars Cleveland, on all pipe from 3-inch to 20-inch, and $21 on all pipe from 24-inch to 48-inch, the total of this company's bid amounting to $68,782.50. R. D. Wood & Co., Philadelphia, bid as follows: 3-inch, $32; 4-inch, $24.30; 6-inch to 10-inch, $22.30; 12-inch to 24-inch, $21.80; 30-inch to 48-inch, $21.55, and the total was $70,845.15. The American Cast Iron Pipe Co., of Birmingham, Ala., bid as follows: 3-inch, $30.40; 4-inch to 24-inch, $22.40. They did not bid on the other sizes.

The bid on special castings by the Bowler Foundry Co. was $11,991.01; by the United States Cast Iron Pipe & Foundry Co., $12,258, and by R. D. Wood & Co., $13,962.50.

Cast Pipe is Slow

Chicago, Oct. 12.—Comparatively little business is being done by cast iron foundries and the usual activity at this season is lacking. The United States Cast Iron Pipe & Foundry Co. has taken 200 tons at Evanston, Ill.; 350 tons at Redbud, Ill.; 150 tons at Rockwell City, Ia., and 100 tons for the South Park Commission in Chicago.

(*For complete prices see page* 742.)

Foreign Inquiry

Is Factor of Wire Business—Mills Are Busy

Pittsburgh, Oct. 13.—Manufacturers of wire products in the Greater Pittsburgh district, who are operating plants at about 80 per cent capacity, are fairly well satisfied with prevailing conditions. Autumn activity has been augmented by an unusual demand for export shipment, almost every mail bringing in specific inquiries for wire nails or barb wire for shipment to belligerent nations. THE IRON TRADE REVIEW, last Saturday, was called upon by an important English buyer of hardware, iron and steel pipe, etc., who cabled for immediate quotations from makers in this district on wire nails, barbed wire and hoop iron, 26 to 30 gage, in coils. Premiums were offered for nails in bags instead of kegs, as is the customary method of packing in this country.

Wire Mills Busy

Cleveland, Oct. 13.—The wire industry continues to give a good report of itself. Specifications from jobbers are liberal and prices are being well maintained. Cleveland plants of the American Steel & Wire Co. are operating at fully 80 per cent of their capacity.

Coke is Dull

And Prices Are Nominal—Some Shading on Spot

Pittsburgh, Oct. 13.—After a slight spurt, the market for Connellsville coke again is dull and inactive. There is no demand for either furnace or foundry coke, and prices are regarded as nominal. Spot furnace coke is being held at $1.75, ovens, by some dealers, but fuel has been sold at 10 and 15 cents a ton under that figure. Foundry coke has sold as low as $2.15 for immediate shipment. The *Connellsville Courier*, for the week ending Oct. 3, says production in the upper and lower Connellsville regions was 249,152 tons, an increase of 1,931 tons compared with the week before. The report indicates that weekly shipments still hover around 250,000 tons.

Southern Coke Dull

Cincinnati, Oct. 13.—The southern coke market remains very quiet with demand at a minimum. Foundries in this territory have practically all closed for requirements to Jan. 1.

Workmen Going to War

One English Firm Sends Two Thousand to Fight —Pig Iron Prices Recede

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Oct. 2.

We are still awaiting some decisive result of the gigantic battle on the Aisne, but unless the military critics are mistaken the result cannot now be long delayed, and the portents are all in favor of the Allies. The business tone of the country continues to improve; only yesterday Sir George Pragnell, chairman of the Wholesale Textile Association, declared that "Trade generally is splendid, considering everything." He added, "If all of us play our parts wisely, and with a thought for others, this war is going to prove a great page in our history. While the bank return shows only a small improvement in the reserve the balance is still well on the right side, and the financiers are very well satisfied. We have received in Birmingham, in common with every other city, large numbers of Belgian refugees who are being very comfortably accommodated, and the country is quite prepared to hear that some thousands more will have to find a temporary home in this country.

Pig Prices Weaken

The week has been a quiet one in respect of pig iron, and prices are somewhat weaker. It is becoming evident that the excited boom which followed the outbreak of war has run its course, and that normal values will be on the basis of much more modest figures. Yesterday's quotation at Glasgow was 50s 11d ($12.22), while the stocks have increased to 103,500 tons. In view of the arrest of shipments, this is considered fairly satisfactory. Consumers' requirements are no longer urgent, not through any falling off in business, but because everybody was supplied after the war broke out. Most users will be comfortably off for material until the new year, and they are prepared to take their chance then.

Finished Iron and Steel

While there is less new business about, the works are still well engaged on orders placed a couple of months ago. A few inquiries suggest that material will be wanted shortly. In view of the enormous reconstruction that must follow the war, a boom is looked for whenever the time arrives to reconstruct destroyed buildings, bridges, forts, etc.

The effect of the war was apparent in the bi-monthly return issued today of the Midland Iron and Steel Wages Board, covering the period of July and August. Contrary to expectation there has been a slight advance in the selling price. This means that the decided increase in August after the declaration of war counterbalanced the persistent reduction in July. The average for the two months was £6 16s 4d ($32.92), compared with £6 16s 9d ($33.20) during May and June. The comparisons of the sections are interesting. Bars have fallen from £6 18s 8d ($33.28) to £6 18s ($33.12). Angles and tees have increased from £7 2s 9d ($34.26) to £7 8s 7d ($35.66), plates and sheets from £8 4d ($38.48) to £8 2s 10d ($39.08), hoops, strip and miscellaneous from £6 7s ($30.48) to £6 7s 8d ($30.64). The last item is a little surprising in view of the enormous advantage to the strip mills arising from the stoppage of foreign supplies. Wages continue unchanged under the return, the rate for pussling being 9s 6d ($2.28) per ton.

The competition of the recruiting sergeants has made itself felt at the furnaces and mills, a few of which find great difficulty in running full time, but the places of the soldiers are being gradually filled up.

As illustrating the large drafts of workmen into the army the chairman of Bolckow, Vaughan & Co., mentioned at their meeting the other day that there were now serving with one or other of His Majesty's forces 2,033 of their men. The firm report a gross profit of £246,000 for the year as compared with £525,000 in the previous year, and they pay a dividend for the year of 6 per cent; but for the present they are only paying half the dividend, reserving the remainder to a period when trade resumes a more normal position.

Warehouse Business Better

Chicago, Oct. 13.—Warehouses find conditions somewhat better at present than during the past month, but with construction at a low ebb, due to difficulty in financing projects, a considerable gap remains in the usual business at this time of the year. Aside from this factor, orders are in fair volume and last week and that preceding were considerably better than most of September. Prices on steel and iron bought from store remain unchanged.

Bars in Demand

Cincinnati, Oct. 12.—Warehouse orders are not satisfactory, but they are about equal to those of the past three weeks. Twisted concrete reinforcing bars are probably the best in demand, as contractors on concrete work are making every effort to advance their building operations as far as possible before the cold weather sets in. Hoops are still selling considerably below those in surrounding territories, being quoted here at about 1.80c. Prices do not show any tendency to change.

METAL MARKETS

New York

Oct. 13.

The course of prices in the non-ferrous metal markets during the week has been quite uniformly downward, and demand has been unusually dull. Practically the only exception was antimony, which, as a result of good demand from England, involving shipment of the metal from American ports to that country and Russia, advanced. Although there is practically no domestic demand, because of the decreased stocks here, as well as the possibility of a further demand from abroad, prices continue rather firm. On the basis of duty paid, New York, they are nominally as follows: Cookson's 13c; Hallett's 12c; Hungarian 11c.

Tin has sagged off all the week. This morning there was a slight show of steadiness as a result of better inquiry, but this afternoon the market again is weak and lower. Spot sold at 29.85c and 29.87½c, and, in one case, as low as 29.75c. October is quoted at 29.75c, and November and December at 29.62½c to 29.65c. Consumption of tin is falling off and although arrivals are not coming in as fast as last month there is an opinion in some quarters that tin will be even cheaper in a month or two than at present.

Copper has weakened steadily and although some producers still hold for 12c, delivered 30 days, for electrolytic, these interests are automatically out of the market, as others are willing to sell at 11.62½c, delivered 30 days, and even less. The market may be quoted nominally at 11.50c to 11.62½c, delivered 30 days. Good ordinary brands of prime lake may be quoted at 11.75c, cash, at which price they are offered in the outside market. It is believed the producers also would meet this figure. Prime casting copper is quoted at 11.37½c delivered 30 days.

The price of lead has been reduced by the American Smelting & Refining Co. to 3.50c, New York, and 3.42½c, St. Louis. There still is shading in the outside market, independent producers having made sales at 3.-32½c and 3.35c, St. Louis, which is equivalent to 3.47½c to 3.50c, New York. These interests, in some cases, would do as low as 3.30c, St. Louis, on good tonnages.

Spelter also has weakened in price almost daily. Today there are free offers of prime western brands at 4.62½c, St. Louis, and on good tonnages 4.60c, and probably less, could be done. The market may be quoted at 4.-60c to 4.62½c, St. Louis, or 4.75c to 4.77½c, New York.

The situation in aluminum is entirely unchanged as there have been no signs of activity in this metal.

Radical Plan for Dissolution

Proposed in Suit Against the United States Steel Corporation

Would Break Up the Company Into Small Concerns, No One of Which Should Manufacture More Than Ten Per Cent of Its Kind of Product Made in the Country

An elaborate brief of 851 printed pages has been filed by Judge J. M. Dickinson and Henry E. Colton, special assistants to the attorney general in the dissolution suit of the United States government against the United States Steel Corporation, which is to be argued in the district court of the United States for the district of New Jersey, beginning Oct. 20. For the first time the government gives in specific language its plan for dissolving the Corporation. It asks that the dissolution be carried out as follows:

"That the ownership and control by the Corporation of the Carnegie Steel Co. of New Jersey, the Federal Steel Co., the American Steel & Wire Co. of New Jersey, the National Tube Co., the American Sheet & Tin Plate Co., the American Bridge Co., the Shelby Steel Tube Co., the Lake Superior Consolidated Iron Mines, the Pittsburgh Steamship Co., the Union Steel Co., the Clairton Steel Co., and the Tennessee Coal, Iron & Railroad Co., are as to each of said companies an unlawful combination in restraint of trade;

"That the Carnegie Steel Co. of New Jersey, the Federal Steel Co., the American Steel & Wire Co. of New Jersey, the National Tube Co., the American Sheet & Tin Plate Co., the American Bridge Co. and the Shelby Steel Tube Co., are each an unlawful combination in restraint of trade;

"That the Carnegie Steel Co. of New Jersey, which combined under one control the Carnegie Co. of New Jersey, the National Steel and the American Steel Hoop, the American Sheet & Tin Plate Co., which combined in one corporation the American Tin Plate Co. and the American Sheet Steel Co., the Federal Steel Co., the American Steel & Wire, the National Tube, the Shelby Steel Tube and the American Bridge, be divided under wholly independent ownerships, with no stockholders in common, so that no person or company shall own or control works whose production, as shown by recent previous years (1912 or 1913 being suggested), in any of the principal iron or steel products, exceeded a percentage to be fixed by the court (10 per cent being suggested as a maximum), of the entire production of same for the United States for said year;

"That the Duluth & Iron Range Railroad Co. and the Duluth, Missabe & Northern Railroad Co. be made independent, not only of each other, but of any concern or corporation taking over any of the properties of the Corporation;

"That those concerns that shall come severally into control of the properties of the Corporation be enjoined from in any way combining or selling their products through the United States Steel Products Co. or any common agency, and from having directors in common;

"That the Tennessee Coal, Iron & Railroad Co., the Union and the Clairton, each be made entirely independent of the control of any persons or company which shall come into control of any of said sub-divisions, and without any stockholders in common;

"That the ore and coal properties of the Corporation, other than those of the Tennessee, be divided among the Clairton, the Union and the new concerns created, in proportion to their capacity for the production of steel;

"That the Great Northern lease is unlawful and that it be cancelled;

"That Andrew Carnegie was a party to the unlawful combination of properties through the Corporation, and took the bonds of the Corporation with all the infirmities attaching to such participation;

"That the said several defendant corporations shown to be subsidiaries of the Corporation be enjoined from declaring or paying any dividends to said Corporation or to any person or corporation for its use;

"That the defendants and each and every one of them, and the officers, directors, stockholders and agents of the defendant corporations and of each and every one of them, be perpetually enjoined from doing any act in pursuance of or for the purpose of carrying out any of said unlawful combinations;

"That a receiver be appointed to take over all of the properties owned or controlled by the Corporation and its said subsidiaries for the purpose of making effective the decree and orders of the court, and that such receiver be authorized and directed to take steps to recover for the use of the Corporation from the syndicate subscribers and promoters, and others who were parties to said unlawful combinations, the difference between the par value of the stock received by them severally, and the cash value of the properties, or the services, given therefor, and this in order that restitution, so far as possible, may be made to the other stockholders;

"That costs be awarded against each of the defendants other than J. H. Gruber; and

"That jurisdiction be retained of the cause for fully effectuating the decree of the court."

Like Tam O'Shanter's Mare

In discussing the testimony of various witnesses as to what occurred at meetings of the committees which discussed prices, the brief says:

"All of these witnesses draw a distinction between 'agreement' and 'understanding.' They had been carefully indoctrinated as to 'agreements' and shied from them like Tam O'Shanter's mare from a witch. When counsel for the Corporation cross-examined Corey, 'understanding' and its effect were tabooed and only the bogie 'agreement' was referred to."

The Tin Plate Consolidation

The brief is in two parts, the first part being devoted to a consideration of the formation of the United States Steel Corporation and subsidiaries, and to a discussion of the alleged restraint of trade and power thereby achieved. The brief discusses at length the various steps taken in the formation of the Corporation and comments thereon. For example, in discussing the consolidation of the tin plate companies it says:

"The defendants did not attempt to

disprove the evidence introduced by the government that prior to and when the Tin Plate company was formed, the concerns acquired by it were keen and active competitors of one another in interstate commerce in tin plate and kindred products. On the contrary, an effort was made upon the cross-examination of government witnesses, to prove the allegation of the answer, that before and at the time of the organization of the Tin Plate company there existed a destructive competition between the concerns so acquired which had reduced many almost to insolvency."

Referring to alleged over-capitalization, the brief says:

"The excessive over-capitalization of the American Tin Plate Co. is indicative of the unlawful purpose of the organizers and the abnormal character of the consolidation. Of the $46,000,000 of capital stock issued, the petition charges that $10,000,000 of the common stock went to the organizers. The answer admits that $10,000,000 of the common stock went to the 'organizers or underwriters'."

The Rail Pool

The rail pools or agreements are reviewed at length and it is asserted that the competition of 1897 and 1898 was destructive of the abnormal and excessive profits that had been exacted on rails and other steel products. An article published in THE IRON TRADE REVIEW of April 5, 1899, is quoted as to an understanding between Johnstown, Pittsburgh, Chicago and Pueblo rail mills to maintain prices. Commenting on this understanding, the brief says:

"The purpose, judged by the natural effect of the arrangement to divide proceeds among those involved in the combination and by concerted action to maintain prices, except as against the competition of competitors in the east not parties to the pool, was to work injury to the public by unlawful maintenance of prices and injury to competitors by taking business at cut prices by concerted action, the loss sustained by the member of the combination who took the business from the outsider at a cut price being made up by a division of the proceeds. The most prominent persons concerned in this unlawful arrangement were Carnegie, Gary, Frick, H. H. Porter and Schwab."

The Conneaut Project

Considerable space is devoted to the Carnegie plant proposed to be built at Conneaut, as announced in THE IRON TRADE REVIEW, of Jan. 10, 1901. The testimony of Judge Gary given before the ways and means committee of the House of Representatives, December, 1908, is quoted and commented upon as follows:

Mr. Cockran: But what I want to direct your attention to is this: In 1901 was there not a fear of a steel war coming from Mr. Carnegie's announcement that he was going into the tube business?

Mr. Gary: Yes; and that he was going to build a railroad from Pittsburgh to New York, and so forth.

* * * * *

Mr. Gary (interrupting): There was apprehension of trouble.

Mr. Cockran: And it was to quiet that apprehension and remove the doubt that the Steel Corporation was formed?

Mr. Gary: That was one of the governing motives, I think, on the part of Mr. Morgan. It was not mine, Mr. Cockran; not at all.

"Gary attempted, as usual, to explain away the plain meaning of his language, saying, among other things, that the inquiry then in progress had to do with a totally different subject from this suit.

"This is true, and for that very reason, inasmuch as his language is clear, it is unnecessary to consider his labored explanation. Accordingly, we will limit, in order to save space, what he had to say in regard to the above testimony to the single question as to whether he gave that testimony. When asked whether he testified as there recorded, he said:

"'Judge Dickinson, I do not think I ever read that testimony after it was written up. I am not sure that I said exactly what is reported there, but I am not disposed to dispute.'

"The question was then repeated, as to whether he had given the testimony above referred to, and he answered: 'I thought I had answered that.' He said that he stated the facts as he understood them and believed them. He said he thought he had said later on in the record of the tariff hearings 'that certainly the building of the National Tube was not in my mind. I have no recollection of having heard of any such threat myself.' He could not recollect one of the most notorious and momentous things that ever occurred in the steel business."

Cimmerian Darkness

After discussing the various pools, the brief says:

"For Gary to profess entire ignorance of the connection of all of said subsidiaries with said respective pools throughout that period is to proclaim himself as about the most ignorant person then in the steel business. If, with the knowledge he admits as to the initial steps for forming the plate pool, and the knowledge that it is just to impute to him, of the subsequent uniformity of prices, which, as already shown under said pools, were generally maintained, he made no inquiry as to the outcome of those steps and remained in total ignorance of the operation of said pools from 1900 to 1904, then the Cimmerian darkness in which he moved in respect to matters of such common knowledge seems nothing short of willful blindness."

Advance in Prices

The brief asserts that the average monthly prices of most of the heavier steel products were substantially advanced while negotiations were pending for the formation of the Corporation, and were further substantially advanced after its formation. On this subject, the brief says in part:

"In January, 1901, prior to the formation of the Corporation, according to said Carnegie current prices, the average monthly price of billets was $19.75, of rails $26, of tank plates $1.40 per hundred pounds, of beams $1.50 per hundred pounds, of merchant bars $1.35 per hundred pounds, of splice bars $1.15 per hundred pounds, and of angles and universal plates $1.40 per hundred pounds.

"The average monthly prices of said products in May, 1901, were, respectively, $24.50, $28, $1.60, $1.60, $1.45, $1.60 and $1.60."

American Bridge Co.

The history of the American Bridge Co. is reviewed and it is charged that: "The purpose of the promoters of the Bridge company to surpress competition is indicated not only by the very large proportion of the total capacity of the United States for the fabrication of heavy bridge material and heavy structural material acquired through the combination of concerns previously competitors in that business, but also by the fact that they endeavored to obtain control of other bridge companies which they were unable to secure."

The Shelby Steel Tube Co.

The taking over of the Shelby Steel Tube Co. is discussed and it is asserted that there can be no doubt that the corporation in acquiring the Shelby, "actually and knowingly absorbed its most important competitor, thereby suppressing competition, gaining complete control of the seamless tube business, and giving additional evidence of its continuing purpose to violate the law."

After discussing the taking over of

the Troy Steel Products Co., it is asserted that "it is practically certain that the corporation bought the Troy steel plant in order to eliminate the possibility of its going into the manufacture of pipes, and because competition from this source was feared by reason of the connection of the Troy company with the Standard Oil interests, which were large consumers of pipe and important customers of the National Tube Co."

The absorption of the Clairton Steel Co. is reviewed and declared to be another step to suppress competition. Likewise, it is alleged that one of the purposes of the acquisition of the Hill ore lease was to forestall all competition and to increase the monopolistic power which the Corporation already enjoyed in respect to the ores of the Lake Superior district.

The Tennessee Deal

Many pages are devoted to a consideration of the taking over of the Tennessee Coal, Iron & Railroad Co. by the Steel Corporation at the time of the panic of 1907. It was asserted that the statement made by Messrs. Gary and Frick that Moore & Schley held the majority of the securities of the Tennessee company was false and that other statements were misleading. It is also alleged that important facts were withheld from President Roosevelt, while his attention was diverted to misleading statements.

The Gary Dinners

Much attention is given to the Gary dinners and to the meetings of committees connected with the price maintenance movement. Among the allegations made as to the price maintenance policy are the following:

"The Gary dinners, the subcommittees appointed in connection therewith, and the meeting of manufacturers under their auspices controlled and maintained prices of the leading steel products manufactured by the subsidiaries of the Corporation for long periods at a time under the directing influence of the Corporation, which not only dictated the prices to be charged by its subsidiaries, which controlled more than a majority of the production in most of said products, but constantly and directly brought about concerted action by many of its competitors.

"Prices which the Steel Corporation and the other manufacturers sought to maintain by concerted action through the Gary dinner movement, and succeeded in maintaining to a large extent during the period from November, 1907, to Feb. 18, 1909, were boom prices. Preposterous as maintaining boom prices in a period of depression may seem, such is the fact.

"The real purpose of the maintenance of these relatively high prices during the period from November, 1907, to Feb. 18, 1909, was not to protect the jobbers and customer manufacturers in respect to stocks on hand, but to prevent competition and maintain prices. The movement was continued after the stocks had been disposed of, and was a part of the constantly pursued plan of artificially controlling prices.

Business Stimulated.

"The effect of the radical reductions in prices of steel products, especially the heavier steel products, such as those manufactured by the Carnegie, was to greatly stimulate business and increase production in said products; and its effect during the brief periods for which the Carnegie Steel Co. kept in effect its relatively low prices, to wit, from Feb. 19, to May 19, 1909, was to give the Corporation the lion share of the business. From May 7 on until Nov. 11, 1909, the Carnegie Steel Co. kept advancing its prices until they reached approximately those which prevailed prior to the declaration of the open market. This gave the other manufacturers a chance to get their share of the business, with the result that the production for 1909, both for the subsidiaries of the Corporation and for the other manufacturers of steel, was greatly increased over that of 1908.

"The Gary movement of maintaining high prices during 1908, accompanied, as it naturally was, with a low percentage of production, cannot be defended on the ground that it conferred benefit upon labor, for the effect of the low percentage of production in 1908 was far more disastrous as regards the workmen than any reasonable reduction in wages would have been. They were not willing to keep up production and lower the standard of prices, but preferred to cut production and maintain prices.

"The Corporation has controlled and generally fixed prices which its subsidiaries were to charge for steel products, although occasionally, such as during the open market of 1909, it has doubtless given the officers of the subsidiary companies some discretion in respect to prices."

The Ivanhoe Furnace Co., Ivanhoe, P. O., Va., is developing zinc deposits which it located in connection with its iron ore properties in Wythe county, Va. Zinc ore is being mined and shipped.

Short Hours

And Closed Plants on Account of Depression in Trade

Depressed conditions in the steel trade are responsible for a reduction in working hours at the plants of the Cambria Steel Co., Johnstown, Pa., where a nine-hour day has been introduced in some departments. Men had been working 10 hours a day. The cut, which will be in effect for an indefinite period, affects about 1,000 men. The reduction in hours was adopted to give employment to a maximum number of men, but it is equivalent to a reduction in pay.

The Franklin plant of the American Steel Foundries, at Franklin, Pa., employing about 400 men, will close Oct. 16 for an indefinite period. It is understood the Granite City plant of the company, at Granite City, Ill., will shut down Nov. 1. Foundries of the company at Pittsburgh, Sharon and in eastern Pennsylvania, and at Alliance, O., are operating at fairly satisfactory rates.

The Bessemer department of the Republic Iron & Steel Co., Youngstown, O., will not resume operations this week. The department closed down the early part of this month.

The boiler tube works of the National Tube Co., at Syracuse, N. Y., has been closed down as a result of inactivity.

The Standard Engineering Co., Ellwood City, Pa., has resumed operations after an idleness of two weeks. The company took advantage of the present lull to make some necessary repairs.

Operations are being resumed in the plants of the Whitaker-Glessner Co., in the Wheeling district. Eight mills in the plant at Wheeling and six in that at Martins Ferry now are running, after a week's shutdown.

September Ore Receipts at Lake Erie Ports

Out of a total shipment of 5,431,307 gross tons of Lake Superior iron ore during September, 4,260,529 tons were received at Lake Erie ports, distributed as follows:

Port.	September, 1914.
Buffalo	518,072
Erie	72,710
Conneaut	1,117,604
Ashtabula	806,459
Fairport	267,680
Cleveland	938,538
Lorain	299,296
Huron	97,078
Toledo	97,357
Detroit	45,735
Total	4,260,529

MEN OF THE IRON TRADE

Who they are Where they are What they are doing

Charles E. Adams, who has just been reelected president of The Cleveland Hardware Co., is a leading citizen of Cleveland in the very highest meaning of the word "leading," because his influence, his time and his energy are freely given not only to his very successful business, but also to the advancement of the city in many ways. When asked by THE IRON TRADE REVIEW to give a biographical sketch, this is what Mr. Adams wrote:

"My life has been a rather uneventful one although a busy one. I left school when I was 14 years of age and worked for The Chandler & Rudd Co. for seven years. I left there to go with The Cleveland Hardware Co. and have been here 33 years. I have seen this business grow from a pay roll of 50 men, when I started, to now, when we employ about 1,800. I have not had the advantage of anything but a common school education and there has been nothing wonderful in my career; just a steady grind of hard work with a fairly satisfactory return to me for that service. What I have done in a public way, I think you know about. That, of course, has not amounted to much, but I have tried to do my best for the public as I have for my business, believing, as I do, that I owe something else besides the mere accumulating of money."

Except to the citizens of Cleveland where Mr. Adams is so well and favorably known, the above facts which he gives in a very modest way about himself convey but little idea of his successful business and public career. For years he has been a leader in philanthropic, church and Y. M. C. A. work, and as president of the Chamber of Commerce during the year ending April 11, 1911, he rendered conspicuous service. He met serious problems with the greatest judgment, firmness and tact. An address which he delivered on "Good Citizenship," has been very widely quoted, and a group of members of the Chamber of Commerce, at their own expense, had printed a large edition which was circulated among the older school children of Cleveland. In this address, Mr. Adams, said: "The good citizen's relation to his business carries with it the perception of an object to be sought beyond profits. The good citizen in business is seeking to add something to the physical wellbeing of his city and his country. His business represents to him not only an opportunity for himself, but also for his associates. He is generous in appreciation, not only in words, but in more tangible recognition of service rendered. His anxiety to advance those who have earned advancement is realized by every employe in his place of business. He will not deprive a man of a deserved promotion because he is valuable in his present position. He is thoughtful of the comfort of his employes as well as of their product."

In addition to Mr. Adams, the directors elected at the recent meeting of the Cleveland Hardware Co. were: Thomas E. Robbins, Malcolm E. McBride, W. F. Gibbons, Myron T. Herrick, Edgar E. Adams, William H. Chase, William D. Lewis and Alva A. Gay.

A. B. Ambler, 461 Market street, San Francisco, has been appointed Pacific coast representative of the Alan Wood Iron & Steel Co.

Robert E. Mullane, formerly treasurer of the D. T. Williams Valve Co., Cincinnati, has been elected president, succeeding D. T. Williams who resigned recently.

E. Cameron, formerly head of the Cameron Engineering Co., Stroudsburg, Pa., has become associated with the Jas. H. O'Brien Scale & Supply Co., 404 Pearl street, New York.

Charles M. Schwab, president and chairman of the Bethlehem Steel Corporation, has resigned from the board of directors of the American Locomotive Co. The vacancy has been filled by the election of Andrew Fletcher, of W. & A. Fletcher & Co., Hoboken, N. J., manufacturer of marine engines, boilers, etc.

CHARLES E. ADAMS

Frank W. Gardner, superintendent of the rolling mills, and H. L. Brinker, superintendent of the blast furnaces, for the Carnegie Steel Co., at Youngstown, are enjoying a hunting trip in Maine.

W. E. Corey, former president of the United States Steel Corporation, returned from Europe Oct. 9. Mr. Corey spent some time at his chateau in France after the war began. He expressed the opinion that the United States, economically, would not be benefited by the war but that it would fare better, relatively, than others.

The Good Citizen

(From an address by Charles E. Adams)

The good citizen doesn't forget to register, he doesn't neglect the primaries, he tries to find out which nominees are the best men, he rarely or never votes a straight ticket.

The good citizen is willing to accept public office, and still more willing to lay it down when his service has been rendered.

The good citizen does not advocate public improvements and then protest against the tax rate.

He has an interest in the working out of city problems, and a more or less definite knowledge of what they are.

He is neither indifferent to nor over-elated by the census returns, realizing that while the increased size of his city represents an enlarged opportunity for living a full life, it represents also enormously increased civic responsibilities.

The good citizen talks little of charity and gives largely both in time and money.

The humblest workingman may be a better citizen than the wealthiest resident, measured by his opportunity.

U. S. Makers

Will Get Britain's Steel Trade Say Englishman

Pittsburgh, Oct. 13.—As a result of the war, American steel manufacturers will furnish Great Britain the bulk of material formerly supplied by Germany, B. J. Niggemann, of the B. Niggemann Co., 26 Chapel street, Liverpool, told THE IRON TRADE REVIEW this afternoon at the Fort Pitt hotel. He has been in this country the last fortnight negotiating for billets, sheet bars and wire rods. The war, Mr. Niggemann says, will climinate Germany from the English markets.

"We were pleasantly surprised when we found American mills could fill our wants almost immediately," Mr. Niggemann said. "We know our specifications were different from those with which mills in the United States are accustomed, and we feared it would be several months at least before we could find plants to produce commodities formerly obtained from Germany. I have heard nothing but praise from English buyers who have figured in your markets. The United States, I am certain, will get the bulk of the trade Germany formerly enjoyed with Great Britain. I have found, in calling upon representatives of steel companies in the eastern and central states, that American manufacturers not only are anxious to extend their trade, but they are equally willing to change their production methods to conform with our demands."

Mr. Niggemann has been calling upon manufacturers in New York, Cleveland, Chicago, Youngstown, Pittsburgh and Johnstown and plans to visit in Philadelphia and Boston before returning to Liverpool, Oct. 21. He will be at the Holland House in New York several days before sailing.

Death of John W. Boileau

John Wesley Boileau, geologist and mining engineer, well known in the coal and coke trade in western Pennsylvania, died at his home in Pittsburgh, Oct. 9, from a self-inflicted bullet wound. Mr. Boileau had a breakdown in health several months ago and his condition was made worse by a fall a few days before his death. Mr. Boileau was regarded as an authority on coal freight rates. It was through a petition filed by him in 1911 with the Interstate Commerce Commission that coal carrying rates on lake fuel from the Pittsburgh district to lower lake ports were reduced from 88 cents to 78 cents a ton. Comprehensive data and maps, showing rates on coal from the Pittsburgh and adjacent districts to lower lake ports, were submitted by Mr. Boileau to substantiate his claim that the so-called Pittsburgh rate was unfair and unjust.

Mr. Boileau was born Oct. 27, 1873, in Athens county, Ohio. After serving as a country-store clerk and as a school teacher, he became engaged in engineering and contracting work. In 1898, he began an exhaustive study of the Pittsburgh coal fields, and was soon recognized as an authority on the economic and commercial value of the western Pennsylvania coal fields. In 1909, he attempted to merge independent coke companies in the Connellsville district, but was unsuccessful.

Mr. Boileau was a frequent contributor to the technical press of the country. He was identified with many of the national engineering societies and was a member of the more prominent technical and social organizations in Pittsburgh.

Death of Wm. H. Richards

William H. Richards, general manager of the Standard Tin Plate Co., Cannonsburg, Pa., and well known in the tin plate industry of the United States, died suddenly, Oct. 10, while attending a meeting of the Washington County Manufacturers' Association, at the Washington Country Club, near Meadowlands, Pa. He was 56 years old. Mr. Richards was born in Staffordshire, Eng., in March, 1858, and accompanied his parents to this country when a young man. He became connected with the Cannonsburg Steel & Iron Co., Cannonsburg, manufacturer of iron and steel sheets. In 1894, he went to New Kensington, Pa., where he assisted in building what now is known as the Pennsylvania works of the American Sheet & Tin Plate Co., Pittsburgh. Upon the formation of the United States Steel Corporation, Mr. Richards was transferred from the New Kensington plant to the United States works of the American company at Demmler, Pa., where he was in charge of the mill. In 1904, he returned to Cannonsburg, as manager of the Standard Tin Plate Co. Mr. Richards recently was appointed a member of the board of managers of the Pennsylvania Training School at Morganza, Pa.

The Uehling Instrument Co., Passaic, N. J., has discontinued its selling connection with the Uehling Sales Co., 95 Liberty street, New York, and all correspondence should be addressed to the Uehling Instrument Co., Passaic, N. J.

Heavy Loss

In Unfilled Orders of Corporation—Lowest in Three Years

September operations of the United States Steel Corporation resulted in a loss of 425,664 tons, in the unfilled orders, according to the monthly report issued at New York City on Oct. 10. While a heavy loss had been foreshadowed, the amount reported was greater than generally was expected. It brings the total orders on Sept. 31 to 3,787,667 tons, which is the lowest point since Oct. 31, 1911. At the close of August, this year, the orders were 4,213,331 tons.

Upon the assumption that the Steel Corporation in September shipped as heavily as it produced, that is, around 60 per cent, which is equivalent to about 27,000 tons, daily, it is indicated that new bookings in the month averaged only about 10,000 to 11,000 tons daily.

Prices Slip

In Pittsburgh District on Plates, Shapes and Bars

Pittsburgh, Oct. 13.—Weakness displayed by plates, shapes and bars in adjacent territory has affected the market at this center, and it appears as if the market had fallen back to its former position, with all three products selling at 1.15c; some material, however, continues to command 1.20c. Specifications are light, new demand is inconsequential and mill operations are not estimated at more than 60 per cent. Failure of these commodities to hold at 1.20c is attributed to a combination of unfavorable influences, including the European war, stringent finances, and the unsatisfactory condition of the railroads.

Steel Wheel Buying

Pittsburgh, Oct. 14. (By wire.)—Transportation companies of the Steel Corporation have been placing contracts for steel wheels with the Carnegie Steel Co., these including 1,000 wheels for the Duluth, Missabe & Northern, 700 for the Bessemer & Lake Erie and 300 for the Union railroad.

Sheet Piling Contracts

Pittsburgh, Oct. 14. (By wire.)—The Carnegie Steel Co. has taken an order for 475 tons of sheet piling for a pumping station at Cleveland of which the general contract went to John F. Casey Co. The Carnegie company also has taken 100 tons of piling for the East Ohio Gas Co. building, also at Cleveland.

Tests of Vanadium Steel Rails

Results of an Investigation to Determine the Fitness of Vanadium Rails for Modern High Speeds and Heavy Loads

THE American Vanadium Co., Pittsburgh, recently made a series of tests on vanadium and carbon steel rails which bring out some interesting points. The tests were very complete and owing to lack of space can only be summarized in this article. The favorable influence of vanadium on steel for ordinary purposes has been thoroughly exploited and the qualities which make the use of vanadium advisable in such cases are equally potent in the case of rail manufacture. Until recently, however, the price of vanadium has been too high to make it commercially practicable to use it in rails.

The rails, which were used in the tests made by the Vanadium company, were rolled by the Cambria Steel Co., Johnstown, Pa.

The general features of the rail problem have been fully covered in previous articles in THE IRON TRADE REVIEW, and the requirements of the situation are thoroughly understood both by the rail manufacturers and the rail users. What is wanted is a steel of greater strength, toughness and wearing qualities coupled with homogeneity and freedom from segregation. To a degree at least, vanadium steel seems to fit these conditions. The investigations of the American Vanadium Co. indicate that in manufacturing rails from vanadium steel no changes in mill practice are necessary. It is said the steel rolls clean and shows no tendency to crack or tear. No change is necessary in the gages as vanadium steel shows the same shrinkage as simple carbon steel. Also nothing has developed in the melting, casting, heating or rolling of the vanadium steel rails to indicate that the mill output will be reduced in any way.

The vanadium rails are said to meet all the requirements specified for ductility and deflection and in the tests were stiffer and more resilient than the 100-pound carbon steel rails of the same section with which they were compared. The vanadium rails deflected about the same amount from an 18-foot blow as the carbon rails did from a 15-foot blow.

The vanadium rails showed an elastic limit, or useful strength, averaging approximately 40 per cent higher than plain carbon steel rails, although the latter had a 50 per cent higher carbon content. The ratio of elastic limit to tensile strength is 70 per cent for the vanadium rails as compared with about 57 per cent for the carbon rails. The ductility or toughness of the vanadium rails is also high. Alternating impact tests showed that the vanadium steel of high elastic limit has great endurance under repeated stresses and is free from brittleness.

It is said that although the vanadium rails were harder than the carbon rails with which they were compared, the bending tests were equally good. The vanadium rails show considerable uniformity of hardness throughout the entire section and are said to be from 10 to 35 per cent harder than carbon steel rails containing 50 per cent more carbon. This superior hardness, combined with the high elastic limit and great toughness of vanadium rails, indicates an increase in wear resisting qualities. Furthermore, it is stated that the vanadium rails showed no segregation and all of the variations in the analyses were within the allowable limits of observational error. As the accompanying illustrations indicate, sections from vanadium rails etched with boiling dilute sulphuric acid show a dense uniform structure free from piping, slag and other defects.

In making the test, three heats of

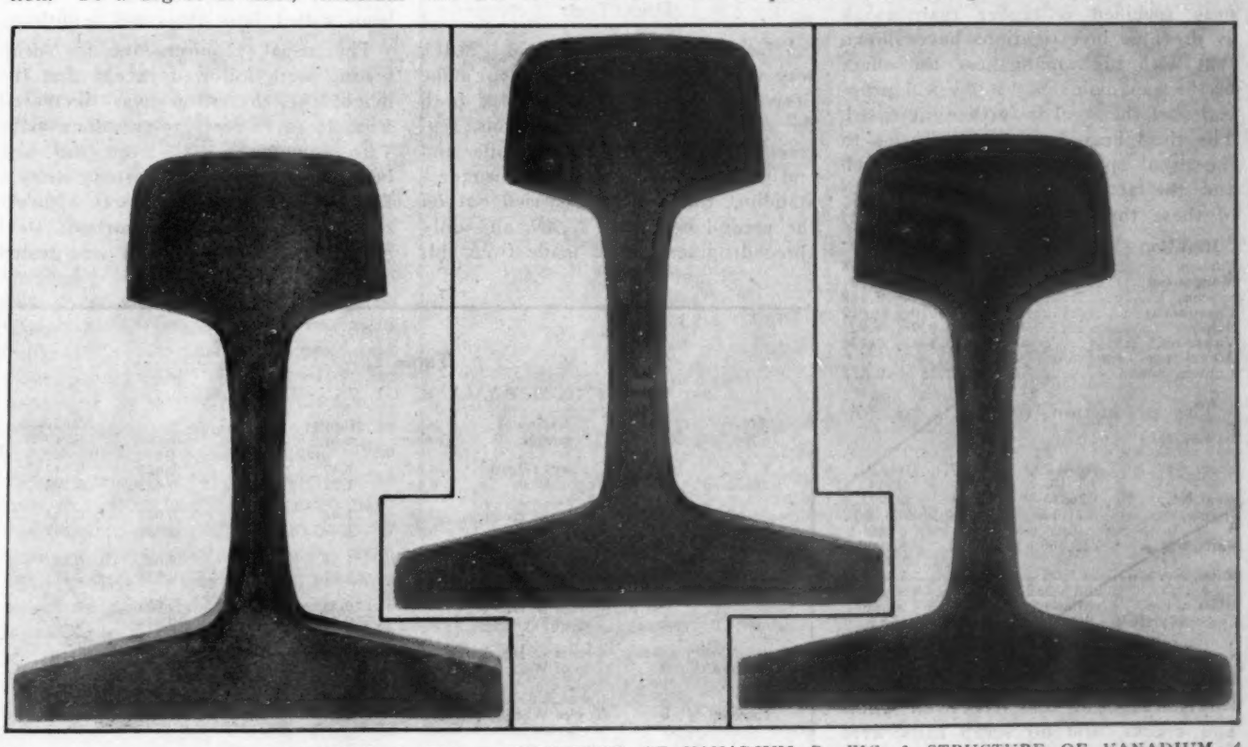


FIG. 1—STRUCTURE OF VANADIUM *A* RAIL FROM HEAT NO. 26813

FIG. 2—STRUCTURE OF VANADIUM *B* RAIL FROM HEAT NO. 26813

FIG. 3—STRUCTURE OF VANADIUM *A* RAIL FROM HEAT NO. 27989

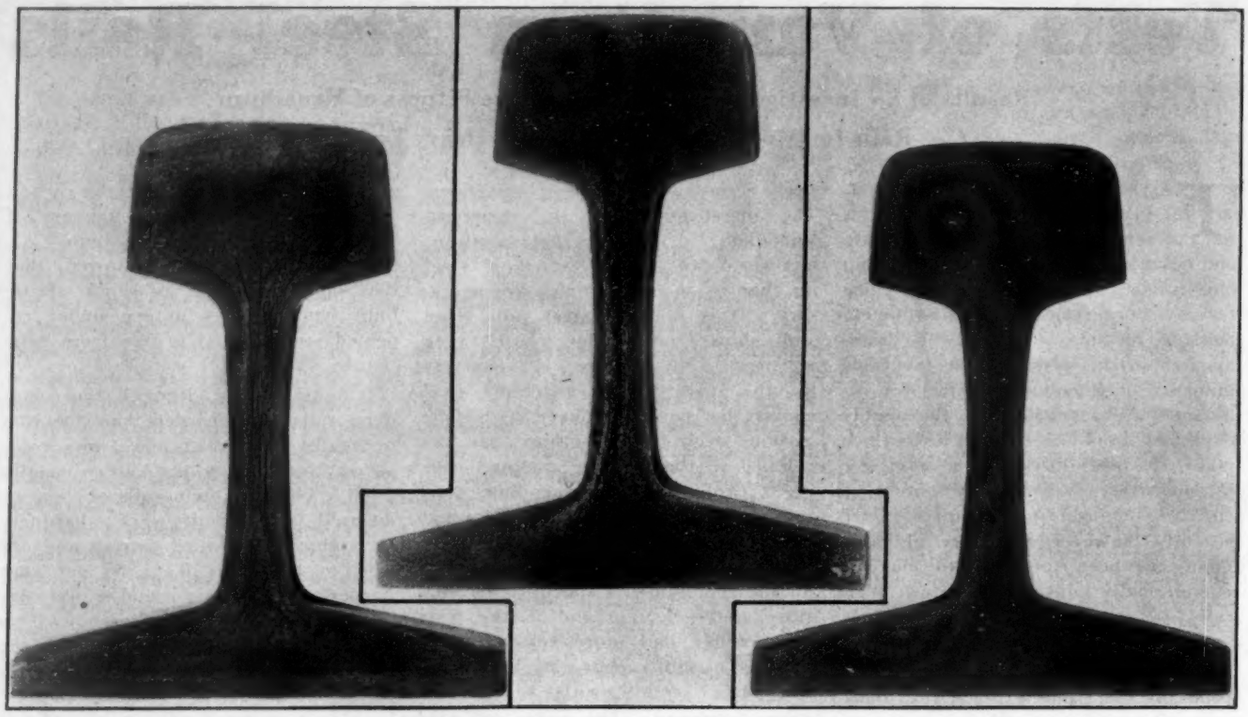


FIG. 4—STRUCTURE OF CARBON *A* RAIL

FIG. 5—STRUCTURE OF CARBON *B* RAIL

FIG. 6—STRUCTURE OF VANADIUM *A* RAIL FROM HEAT NO. 27993

vanadium steel were made to the following chemical specifications:

Heat No.	26813	27989	27993
Carbon	0.45 to 0.65	0.40 to 0.52	0.60 to 0.75
Manganese	1.10 to 1.40	1.00 to 1.30	0.75 to 1.00
Silicon	under 0.20	under 0.20	under 0.20
Phosphorus	under 0.05	under 0.05	under 0.05
Sulphur	under 0.05	under 0.05	under 0.05
Vanadium	4 lbs. per ton	4 lbs. per ton	4 lbs. per ton

In the first two heats, the manganese specified is higher than usual, as previous investigations have shown that with high manganese the effect of the vanadium on the physical properties of the steel is further increased. The third heat, however, conforms to the usual specifications for rail steel, and the actual chemical composition of these three heats was as follows:

Heat No.	26813	27989	27993
Carbon	0.55	0.51	0.558
Manganese	1.51	1.11	0.78
Silicon	0.17	0.12	0.158
Phosphorus	0.015	0.010	0.017
Sulphur	0.019	0.029	0.025
Vanadium	0.148	0.146	0.156
Actual per cent vanadium added	0.168	0.16	0.177

The production record is as follows:

Date.	April 22, 1914.	July 27, 1914.	July 27, 1914.
Heat No.	26813	27989	27993
Ingots, wgt.	121,000 lbs.	104,400 lbs.	108,000 lbs.
Rails, wgt.	89,500 lbs.	79,900 lbs.	82,000 lbs.
Rails, No.	77-1st and 5-2nd	73-1st and 1-2nd	73-1st and 2-2nd
Rails, scrap	none	none	none
Per cent yield	74.0	76.9	75.9

All three vanadium steel heats rolled satisfactorily. The blooms were said to be clean and free from seams and cracks, and no scrap rails were produced. Standard gages were used showing that the shrinkage of the steel is the same as for standard carbon rails and no change in this respect is necessary. The top portion of some of the ingots from the first heat were a little soft or green when bloomed and were cropped heavily on this account.

Drop Tests

When the first heat, No. 26,813, was made, it was arranged to make drop tests on the crop ends of both the *A* and *B* rail of three ingots, representing the beginning, middle and end of pouring. Through misunderstanding, this was not carried out on the second heat, No. 27,989, and only three drop tests were made from this heat, one being from a *C* rail crop, as the top blooms from the ingots were rolled into three-rail lengths. The arrangement for two drop tests from the beginning, middle and end of the third heat, No. 27,993, was carried out, excepting that the tests were made on *C* rail crop instead of *B* rail, on account of the top blooms all having been rolled into three-rail lengths.

The usual requirements for drop testing were followed except that the height of the drop was increased from 15 to 18 feet for vanadium rails. Two vanadium rails from the first heat, however, were tested with a 15-foot drop in order to get a direct comparison with the carbon steel rails. One vanadium rail was tested

Table I.

CHEMICAL ANALYSES OF VANADIUM RAILS

Heat No.	Rail.	Location of sample.	Carbon.	Manganese.	Phosphorus.	Sulphur.	Vanadium.
26813	A	Corner of Head	0.55	1.49	0.015	0.023	0.147
		Top of Web	0.56	1.52	0.015	0.022	0.148
26813	B	Corner of Head	0.54	1.46	0.016	0.022	0.144
		Top of Web	0.57	1.49	0.017	0.021	0.147
27989	A	Corner of Head	0.52	1.11	0.013	0.022	0.16
		Top of Web	0.52	1.11	0.013	0.024	0.17
27993	A	Corner of Head	0.56	0.73	0.019	0.023	0.17
		Top of Web	0.57	0.74	0.019	0.024	0.16
Carbon	A	Corner of Head	0.72	0.67	0.035	0.028	....
		Top of Web	0.79	0.68	0.047	0.038	....
Carbon	B	Corner of Head	0.74	0.68	0.011	0.035	....
		Top of Web	0.81	0.69	0.012	0.041	....

with the flange up and all the others were tested in the usual manner with the head up. Six one-inch spaces were laid off on the bottom of the flange in order to determine the ductility or strength after each blow of the drop, the requirements calling for a 5 per cent, or a .05-inch stretch in two adjacent inch spaces. The details of the drop test are given in Table II.

The chemical specifications to which the carbon rails were made are as follows: Carbon, 0.62 to 0.75 per cent; manganese, 0.60 to 0.90 per cent; silicon, under 0.20 per cent, and phosphorus under 0.04 per cent. In addition to the drop tests, one full length *A* rail from each of the three vanadium heats was broken in 10 pieces and the fractures were carefully examined for evidence of piping.

The Tensile Tests

Tensile tests, alternating impact tests were made from rail crops from each heat, together with wear and hardness tests. Crops from the *A* rails were taken from the top end of the rail. Tensile tests were also made from the middle section of each of the vanadium rails which were broken under the gag press. Due to the more rapid cooling of the rail crops, the tests made from them show a little higher elastic limit than those from the mid-section of the three rails broken in the gag press, as these rails cooled much more slowly on the hot beds.

The details of the tensile tests are given in Table III.

The Bending Tests

The bending tests were made on rectangular pieces about 8 inches long. The load was applied about 6 inches from the end of the test pieces. The radius of the jaws holding the specimen was not over ⅛-inch and the edges of the specimen were not rounded. The alternating impact tests were made on bars turned to ⅛-inch diameter. The bar was held firmly in a vise and the upper end moved backward and forward by means of a slotted arm through a total distance of ¾-inch at the rate of 600 movements per minute. The distance from the vise to the slotted arm was 4 inches. Each movement was accompanied by an impact or blow on the bar by the slotted arm. The results of these tests show a range in bending of vanadium rails from 21 to 62 degrees and a range in the number of alternating impacts from 520 to 1,600. The corresponding figures for carbon rails showed a range in bending from 39 to 62 degrees and impacts from 980 to 1,820. Hardness tests were made by the Brinell method. The sections from heat No. 26,813 showed an average hardness of about 340; heat No. 27,989 about 302; heat No. 27,993 about 293; carbon rail *A* showed a hardness approximately 248, and carbon rail *B* about 269.

Chemical analyses were made of rails from each of the vanadium heats to determine whether there was any tendency toward segregation and how the vanadium steel compared in these respects with the carbon steel. For this purpose drillings were taken from two locations in the head of the rail and analyses were made. The details of the analysis are given in Table I.

Wear tests were made by rotating a piece of 1 inch long by 1 inch in diameter between three manganese steel rollers 3 inches in diameter. A

Table II.

DROP TESTS OF VANADIUM RAILS

Heat No.	Ingot No.	Rail.	Height of drop ft.	No. of drops.	Deflection in in.	Elongation in hundredths of an inch, per inch. 1 in.	2 in.	3 in.	4 in.	5 in.	6 in.	Total.	Fracture.
26813	16	A	15	1	0.7	4	3	5	4	4	2	22	
				2	1.4	5	6	8	7	7	5	38	
				3	3.2	16	.	19	17	17	14	..	Clear
26813	16	B	15	1	0.9	3	5	4	4	3	3	22	
				2	1.6	6	9	8	7	4	4	38	
				3	2.3	8	12	12	10	6	5	53	
				4	2.9	13	16	14	10	6	5	64	
				5	3.7	17	23	20	14	8	6	88	
				6	4.6	18	..	19	13	8	6	..	Clear
26813	1	A (Flange up)	18	1	1.0	5	6	7	6	5	3	32	
				2	1.7	6	7	9	8	.	3	..	Clear
26813	1	B	18	1	1.1	4	6	6	4	3	3	26	
				2	1.8	8	9	9	6	4	4	40	
				3	2.7	12	14	11	8	4	4	53	
				4	3.6	15	16	14	10	7	5	67	
				5	3.7	16	..	14	10	6	4	..	Clear
26813	9	A	18	1	1.0	4	4	5	5	4	2	24	
				2	1.8	4	4	5	.	5	3	..	*
26813	9	B	18	1	1.0	3	4	5	5	5	4	26	
				2	1.8	5	6	8	8	8	5	40	
				3	2.6	6	8	.	.	10	7	..	Clear
27989	1	A	18	1	1.0	3	4	5	5	4	2	23	
				2	1.9	4	5	7	10	10	9	45	
				3	...	5	8	11	11	11	9	55	Clear
27989	6	C	18	1	1.1	3	4	5	5	5	5	27	
				2	2.1	5	5	7	10	10	9	46	
				3	...	7	8	12	13	12	10	62	Clear
27989	14	A	18	1	1.1	2	3	5	5	5	5	25	
				2	2.0	5	7	10	10	8	6	46	
				3	...	7	11	16	15	13	10	72	Clear
27993	1	A	18	1	1.0	3	3	4	4	4	4	22	
				2	1.9	4	6	7	8	8	7	40	
				3	...	7	7	9	9	10	8	50	Clear
27993	1	C	18	1	1.1	3	4	5	5	5	4	26	
				2	...	4	5	7	9	8	8	41	Clear
27993	6	A	18	1	1.1	2	3	4	5	5	5	24	
				2	...	3	4	5	7	7	7	33	Clear
27993	6	C	18	1	1.1	3	4	5	5	4	3	24	
				2	2.0	6	8	9	9	8	6	46	
				3	...	7	8	11	10	10	8	54	Clear
27993	14	A	18	1	1.2	4	5	5	5	5	4	28	
				2	2.2	6	7	9	8	8	8	46	
				3	3.2	8	9	11	10	10	12	60	
				4	...	8	9	11	12	13	14	67	Clear
27993	14	C	18	1	1.1	3	4	4	5	5	4	25	
				2	2.1	6	8	10	10	8	6	48	
				.	...	8	11	15	15	11	8	68	Clear

CARBON RAILS.

Test No.											
1	15	1	1.0	3	4	4	3	3	3	20	
		2	1.9	5	6	7	7	7	5	37	
		Nicked									Clear
2	15	1	1.0	4	4	4	3	3	2	20	
		2	1.8	5	6	7	7	6	5	36	
		Nicked									Clear
3	15	1	1.1	4	4	5	5	4	3	25	Clear
		Nicked									

*Web piped. A very small indication of piping which showed on one side only of the wedge shaped piece broken out when the rail broke under the drop.

direct load of 110 pounds was applied to the test piece by loading the top roller. The test pieces were weighed before and after the test and the loss in weight in milligrams was divided by the original weight of the test pieces in order to obtain the comparative figures and allow for variations in weight of test pieces. The tests which follow were all run 50,000 revolutions:

Heat No.	Rail.	Milligrams loss divided by weight of test.	Relative wear.
26813	"A"-Crop	16.3	54
26813	"B"-Crop	13.1	45
27989	"A"-Crop	12.8	44
27993	"A"-Crop	12.2	42
Carbon	"A"	28.8	100
Carbon	"B"	21.1	73

From the results of these tests, the American Vanadium Co. recommends the following chemical specifications for vanadium rails:

Carbon	0.45 to 0.60 per cent
Manganese	1.00 to 1.25 per cent
Silicon	over 0.10 per cent
Phosphorus	not over 0.05 per cent
Sulphur	not over 0.05 per cent
Vanadium	4 lbs. added per gross ton

This specification, it is said, will give rails with high elastic limit, or useful strength, combined with toughness and hardness. The relatively low percentage of carbon recommended, together with the freedom from segregation, should result in the practical elimination of the danger of failure from internal fissures, or silvery oval spots. In ordinary rails, these spots probably originate from minute nodular carbon segregation.

Table III.

TABLE GIVING A PORTION OF TENSILE TESTS ON VANADIUM AND AND CARBON RAILS.

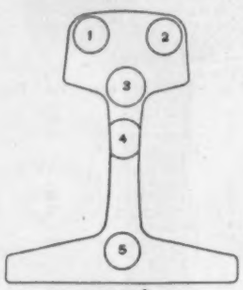


Fig. A

Fig. A—Location of Tensile Tests Where Five Tests Were Made

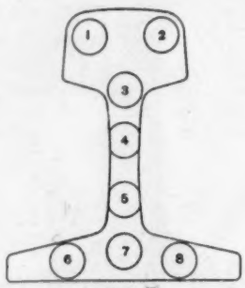


Fig. B

Fig. B—Location of Tensile Test Where Eight Tests Were Made

Vanadium Rails

Heat No.	Rail.	Test No.	Elastic limit lbs. per sq. in.	Tensile strength lbs. per sq. in.	Elongation in 2 in. per cent.	Reduction of area per cent.
		1	130,000	140,000	12.0	22.0
	A	2	102,500	132,500	5.0	5.5
26813	Crop	3	100,000	121,000	*	*
		4	107,500	130,000	*	*
		5	105,000	123,000	*	*
		1	92,600	130,000	12.5	21.5
	A	2	112,000	135,000	13.0	24.0
	Rail	3	90,000	125,000	14.0	24.5
	(Mid	4	98,000	130,000	14.5	25.5
26813	Section)	5	95,000	129,000	15.0	30.0
		6	105,000	137,000	13.0	26.5
		7	92,000	128,000	13.0	20.5
		8	99,000	134,000	15.0	28.0
		1	92,000	134,000	12.0	24.0
	B	3	97,500	125,500	6.0	10.0
26813	Crop	5	102,500	140,000	11.0	20.5
	B					
26813	Crop	7	110,000	147,500	9.0	18.5
		1	100,000	130,500	13.0	27.5
		2	100,000	133,000	12.0	25.5
	E	3	102,500	135,000	11.0	20.5
26813	Crop	4	105,500	142,000	11.5	22.0
		5	105,000	140,000	12.0	25.0
		6	110,000	140,000	12.0	25.0
		7	102,500	135,000	12.0	23.5
		8	107,000	140,000	12.0	25.5
		1	92,000	127,000	13.0	24.5
		2	90,000	127,000	12.0	26.5
	A	3	98,000	130,500	12.0	21.5
27989	Crop	4	97,500	129,500	13.0	27.5
		5	95,000	126,000	14.0	28.0
		6	102,000	132,500	13.0	20.5
		7	88,000	122,000	12.0	23.5
		8	92,500	125,000	13.0	20.5
		1	92,000	130,000	14.5	26.5
	A	2	90,000	125,000	15.5	30.0
	Rail	3	97,250	127,000	5.0	8.0
	(Mid	4	90,000	138,000	9.0	10.0
27989	Section)	5	92,500	130,000	14.5	25.0
		6	90,000	126,000	15.0	30.5
		7	85,000	124,800	14.0	26.5
		8	95,000	127,500	14.5	29.0
		1	80,000	118,000	13.0	22.0
		2	90,000	126,000	12.5	24.5
	A	3	87,500	125,000	11.5	17.0
	Rail	4	80,000	123,000	14.0	23.0
27993	(Mid	5	85,000	125,500	12.0	17.5
	Section)	6	85,000	125,000	13.5	24.5
		7	80,500	122,500	13.5	20.5
		8	80,000	123,000	14.0	27.0

Carbon Rails

		1	63,000	112,500	13.5	20.5
		3	65,000	114,000	9.0	11.0
	A	5	65,000	115,000	12.5	17.0
		7	65,000	115,000	12.5	16.0
		1	60,000	123,000	10.5	14.5
		3	65,000	126,000	9.0	11.5
		5	75,000	125,500	10.0	16.0
		7	57,000	121,000	8.5	13.5

*Broke in Fillet.

Mineral Reserves

George Otis Smith, director of the United States geological survey, has written an interesting pamphlet entitled "Our Mineral Reserves". It comprises a general survey of the mineral resources of the United States, with suggestions regarding the possibility of their further development. The pamphlet is of particular interest at the present time, owing to the readjustment of affairs necessary as a consequence of the war in Europe. Particular attention is devoted to our metallic minerals, including the ores of iron, manganese, zinc, lead, tin, copper, aluminum, antimony, arsenic, platinum and radium. Information also is given regarding the minerals from which cement and other non-metallic products are manufactured.

"Modern Foundry Appliances and Cleaning Room Equipment" is the title of an exhaustive catalog issued by the Central Iron Works, Quincy, Ill. It contains sixty-four 8½ x 11-inch pages, and includes illustrations and descriptions of foundry tumbling mills and their component parts; power transmission machinery including shafting pillow blocks, shaft hangers, etc.; dust collectors and arresters; sand blast equipment; air compressors, etc. A number of typical cleaning room lay-outs add interest to the catalog.

Casting End Rings

An interesting bit of foundry practice has been developed by Fairbanks, Morse & Co. at their foundry in Indianapolis in connection with the construction of rotors for electric induction motors. Originally the copper bars of the rotors were fastened to the end rings by bolts, screws or rivets and later by soldering. Heat generated in the rotor loosened the

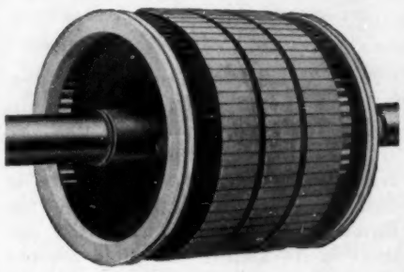


FIG. 1—COMPLETE ROTOR WITH CAST-ON RINGS, SHOWING INSPECTION GROOVES

joints, melted the solder and played havoc generally. Also a mechanically tight joint is not always an electrically perfect joint in any case.

In seeking a permanent type of connection this company hit on the plan of assembling the core and copper bars and then casting the end ring, of a composition rich in copper, producing a fused joint between each extremity of each copper bar and the end rings. After casting, the ring is machined to size.

Fig. 1 shows the complete rotor. It is assembled as shown except for the two end rings. It then is placed

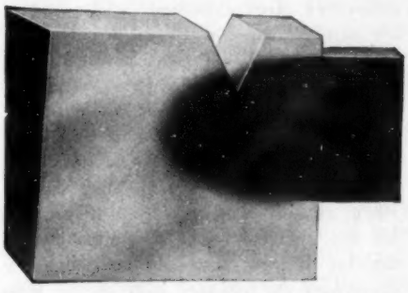


FIG. 2—SECTION OF JOINT SHOWING FUSED UNION OF ROTOR BAR AND END RING

upright in the mold, the weight resting on the end of the shaft, and the molten composition is poured at a temperature of about 1,800 degrees Fahr. The ends of the copper bars are fused and inseparably imbedded in the composition, as shown by the shaded portion of Fig. 2. A groove is turned in the ring when the latter is trimmed, as indicated by the notch in Fig. 2, and the circular line in Fig. 1, going deep enough to pass the line of junction of the bar and ring, thus showing the condition of the joint.

Fig. 3 shows the process of pouring. The first ring is being cast on the two rotors at the left, the center one is about to be poured and on the pair at the right the first has been cast and the rotors set for pouring the second ring.

The high temperature at which the cast is made precludes the possibility of any heat subsequently encountered by the rotor having any effect on the connection between the rings and bars. Thus continuous, perfect electrical conduction is assured.

No special equipment is used in the foundry work and sufficient excess of metal is provided in the rings as

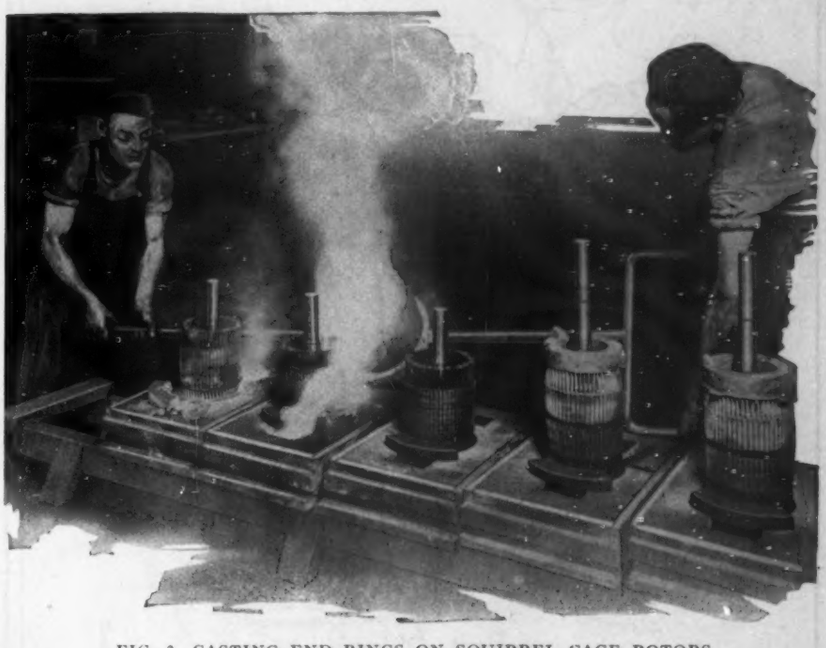


FIG. 3—CASTING END RINGS ON SQUIRREL CAGE ROTORS

cast to allow trimming to exact dimensions in sound metal.

The Westinghouse Electric & Mfg. Co., East Pittsburgh, has issued an illustrated leaflet No. 3742 describing its motor generator sets of various types. The advantages of machines of this character are pointed out.

The Luria Bros. Co., Reading, Pa., iron and steel scrap dealers, has recently installed an Oxweld outfit for cutting scrap by the oxyacetylene process at its yards at Lebanon, Pa. The acetylene is generated in a 100-pound machine mounted on a push car. Three cutting blow pipes are kept in continuous operation. The apparatus was installed by the Pittsburgh office of the Oxweld Acetylene Co., Chicago. The Koehler & Streng Co., Carnegie, Pa., recently has increased its oxyacetylene cutting department. Acetylene now is being generated in an acetylene generator at the plant; the company previously bought compressed gas in tanks. Three Oxweld cutting blow pipes are being operated.

Book Review

Metallurgy, by Henry Wysor; cloth, 391 pages; second edition; published by the Chemical Publishing Co., and furnished by THE IRON TRADE REVIEW for $3.00 net.

This is chiefly a text book covering the general features of the metallurgy of iron and steel, brass, copper, tin, silver, gold, nickel, aluminum, manganese and the rarer metals. The aim of the book, as stated in the preface of the first edition, is to set forth the history, practice and philosophy of metallurgy in a brief and clear manner. The book was designed to supplement a course of lectures given to engineering students. It may be recommended to any one interested in a general treatise on metallurgical problems, without wishing to go very deeply into any of the various processes.

An interesting bulletin describing various types of overhead tramrail systems has been issued by the Whiting Foundry Equipment Co., Harvey, Ill. Various types of tracks, switches, turntables and crossovers are covered, together with trolleys, hoists, etc. Illustrations of typical installations are presented, and special buckets and carriers for handling sand, castings and cores are illustrated and described.

The Iron Ore Industry in Brazil

A Description of the Tremendous Deposits of High Grade Ore in Northern South America, With Comments on the Transportation Facilities

BY E C HARDER

FEW mineral deposits have in recent years attracted such general and widespread attention as the Brazilian iron ore deposits, due mainly to the quantities of rich ore available in contrast to the ever-decreasing grade of ores shipped from dumps. In northern Sweden, where large magnetite deposits have only in recent years been extensively developed, selected mining is even now necessary in order to obtain high-grade Bessemer ores. During the last two years the iron ores of Chile have attracted much attention on account of the activities of the Bethlehem Steel Co. and others in the Chilean iron ore region. Many of these ores are of good grade, yielding 67 and even 68 per cent metallic iron, but judging from the writer's observations in this region a large proportion of them will be found to be of non-Bessemer grade.

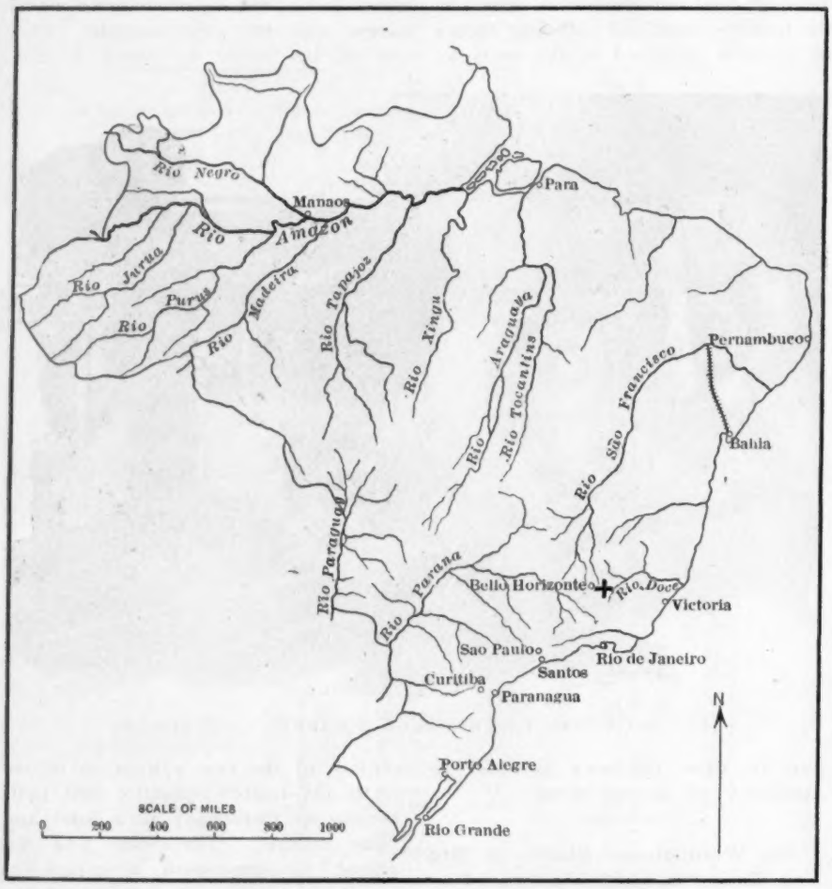


FIG. 1—MAP OF BRAZIL, SHOWING LOCATION OF MINAS GERAES IRON-ORE DISTRICT

The most important variety of iron ore in Brazil is hard, dense to specular hematite, occurring in Minas Geraes. A large number (89) of analyses of this type of ore have been averaged, giving the following composition:

	Per cent.
Iron	69.65
Phosphorus	0.0125
Silica	0.24
Combined H_2O	0.38

In few places in the world has iron ore been found in marketable quantities which even approaches this ore in grade, while in Brazil several hundred million tons of such ore are in sight, occurring practically on the surface, while besides this rich ore there is an almost incredible amount of lower grade ores, i. e., ores of 60 per cent metallic iron and over. It may be found impracticable, when mining operations commence, to mine exclusively the high-grade ores, and that admixtures of other ores will somewhat lower the general quality of marketed material; still it is safe to say that Brazil will be able to furnish for many years ores of Bessemer quality which will average more than 68 per cent metallic iron.

Up to the present time no iron ore has been exported from Brazil, and only a very insignificant quantity has been used to supply the small domestic furnaces. Plans have been made to ship a small quantity of ore from one of the mines in Minas Geraes during 1915, but it will probably be several years before any important quantities are exported. Conditions are not yet ripe in Brazil for the establishment of an iron smelting industry of importance within the country. As there is no coal at present known in Brazil fit for smelting purposes, coal would have to be imported from Europe or North America, and since Brazil cannot afford a market for any great quantity of manufactured articles of iron, it would be necessary to export the greater part of the iron to other countries, thus necessitating double transportation, the bringing in of fuel and the taking out of manufactured iron. For this reason it is proposed to export the iron ore to foreign smelters where the fuel supply and the markets for the manufactured products are close at hand. Eventually, as the demand for iron in South America increases, smelting plants will doubtless be established in Brazil to supply the local market.

The iron ores of Brazil are of two distinct types: (1) magnetite ores associated with igneous rocks occurring

many large producing iron ore districts of the world. The general average grade of the iron ores shipped from the Lake Superior district has decreased to approximately 50 per cent, natural, in recent years. The Rubio ore of Bilbao, Spain, in 1890 averaged 55.5 per cent metallic iron, dried, in 1902, 52.8 per cent, while at the present time a large proportion of the ores shipped from Bilbao, are obtained by reworking the old

Portions of a paper presented at the Pittsburgh meeting of the American Institute of Mining Engineers, October, 1914.

in the States of Minas Geraes, Sao Paulo, Parana, and Santa Catharina; and (2) hematite ores associated with metamorphosed sedimentary rocks in State of Minas Geraes. The magnetite ores are of relatively little importance, occurring only as small scattered deposits.

The hematite deposits associated with the metamorphosed sedimentary rocks in Minas Geraes are the only known iron ores in Brazil to which any considerable importance is attached. They occupy a large area in the south-central part of Minas Geraes, being practically co-extensive with the sedimentary formations in this region. The area within which the principal deposits are found is roughly 100 miles long from northeast to southwest, and about 60 miles in width. Within this region the ore bodies are more or less segregated at certain localities.

The sedimentary series in which the iron ores occur is of probable pre-Cambrian age and rests unconformably on a basement of igneous rocks consisting of gneiss, granite and various crystalline schists. The lowest member of the sedimentary series is a massive quartzite of great thickness which is overlain by a thin discontinuous argillaceous schist. Above this schist is the remarkable Minas Geraes iron formation, which consists largely of a laminated, iron oxide-bearing quartzite known as itabirite, but which contains also beds of ferruginous schist and layers and lenses of iron ore. The iron formation is overlain by an extensive formation of schist and quartzite which contains iron formation and limestone beds in the lower part and which grades up into a formation consisting of quartzite with some schist, the highest known member of the sedimentary series.

Itabirite, the principal constituent of the iron formation, generally consists of alternating layers of quartz sand and iron oxide, but locally it consists of a granular mixture of quartz sand and iron oxide. It probably makes up more than 95 per cent of the iron formation, the remaining 5 per cent consisting of ferruginous schist and iron ore. Itabirite rarely contains less than 30 per cent metallic iron and from this it grades up, with diminishing quartz sand, into ore, the lower limit of which may be taken as 50 per cent metallic iron. Occasionally itabirite, very low in iron, apparently grades down into ferruginous sandstone or quartzite.

The iron formation varies greatly in thickness, in places being less than 50 feet and elsewhere more than 4,000 feet thick. The iron ore and ferruginous schist occur interstratified with the itabirite as beds or lenses varying in length and thickness. The iron ore appears to be a true sedimentary formation, laid down at the same time as the inclosing rocks and later metamorphosed with them. The iron-ore beds have the same strike and dip as the inclosing rocks and outcrop with them at the surface. In many places hard-ore layers form the tops of hills or ridges or form conspicuous cliffs along the hillsides, due to their greater resistance to erosion. When the iron formation weathers at the surface a blanket consisting of a mixture of itabirite and ore fragments cemented by limonite is formed. This blanket may vary in thickness from a few inches to more than 50 feet, and spreads over the surface of the iron formation as well as over the surface of adjacent formations such as schist or granite. This is the iron ore conglomerate or breccia termed *canga*. Below are average ranges in iron and phosphorus content of the principal types of ore, assuming 50 per cent metallic iron as the lower limit for iron ore. These figures are based on extensive sampling, much of it under the direction of the writer.

	Iron, per cent.	Phosphorus, per cent.
Hard massive ore..	69 to 70	0.003 to 0.020
Soft powdery ore..	50 to 69½	0.004 to 0.05
Laminated ore	50 to 68	0.003 to 0.07
Laminated ore (hydrated)	63 to 67	0.05 to 0.3
Canga	50 to 65	0.1 to 0.3

The hard massive ore is hematite, generally dense or finely specular, but occasionally, where strongly metamorphosed, it is coarsely crystalline and has an admixture of magnetite. It occurs in beds varying up to more than 450 feet in thickness and to more than two-thirds of a mile in length. Hard ore rarely contains more than 1 per cent of silica and its metallic iron content is remarkably constant. The soft powdery ore is specular

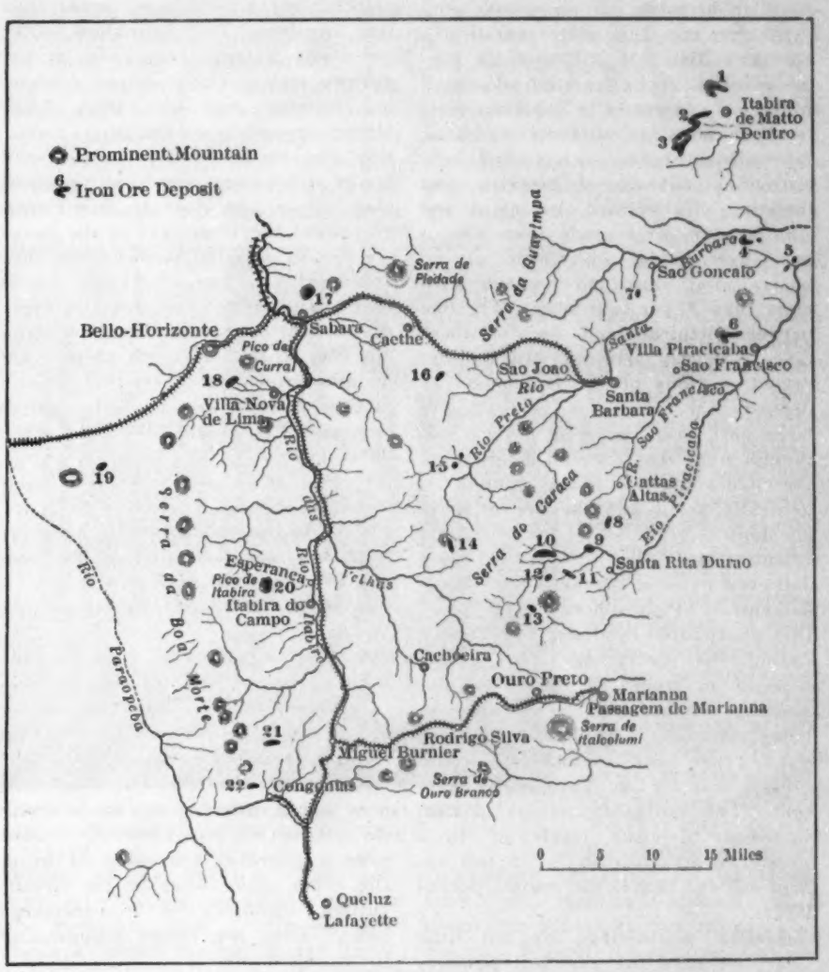


FIG. 2—MAP SHOWING THE LOCATION OF THE PRINCIPAL IRON-ORE DEPOSITS IN MINAS GERAES

1. Caue. 2. Esmeril. 3. Conceicao. 4. Andrade. 5. Monlevade. 6. Morro Agudo. 7. Cocaes. 8. Bananal. 9. Morro da Mina. 10. Alegria. 11. Fabrica Nova. 12. Germano. 13. Timbopeba. 14. Capanema. 15. Mutuca. 16. Gongo Soco. 17. Gaya. 18. Aguas Claras. 19. Jangada. 20. Catta Branca. 21. Fabrica. 22. Casa de Pedra

hematite in a fine friable form, so that most of it when dried crumbles to dust which will pass through a 100-mesh screen. Hard ore and soft ore frequently occur intermixed with each other, lenses or irregular bunches of soft ore occurring in hard ore beds or irregular masses of hard ore occurring in soft ore deposits. Soft ore deposits are in general much smaller and more irregular than hard-ore deposits. Both occur as lenses or beds interlayered with itabirite or laminated ore.

Laminated ore consists of earthy to specular hematite. It is friable and breaks up into thin plates parallel to the lamination. It is also quite porous, allowing free circulation of ground water, on account of which large portions of these deposits are hydrated, especially near the surface, and consist of a mixture of hematite and limonite. Unhydrated, laminated and soft powdery ores grade from almost pure iron oxide, with little or no quartz sand, down to itabirite with more than 30 per cent silica. The line between itabirite and ore in these cases is purely artificial. In the hydrated portions of the laminated ore deposits the silica has generally, in large part, been removed, so that, although somewhat lowered in grade by the hydration, its silica content is generally small and the ore is fairly constant in grade.

Unhydrated ores of various types and even itabirite contain a very small percentage of phosphorus. It appears that phosphorus becomes concentrated during the hydration, either being brought in from the outside or remaining while other materials are being removed. Ore hydrated to beyond 2 per cent combined water increases rapidly in phosphorus content. The hydrated portions of laminated-ore deposits rarely go to a greater depth than 50 or 75 feet except along occasional more porous layers.

Surface weathering has but little effect on hard ore and soft powdery ore. The former is sometimes slightly hydrated along cracks, for a few inches from the surface, while the latter is generally altered to canga to a depth of 10 to 15 feet and below this somewhat hydrated for an additional 4 or 5 feet. The laminated ore is affected to a greater depth by surface agencies, and along with the hydration there is removal of silica. This, however, rarely is sufficient to make an ore of an itabirite, so that but a small percentage of this material can be classed with the concentration ores.

Canga consists of material derived by weathering from the iron formation. The canga blanket is generally thin along the tops of the iron-formation ridges and thick on the lower slopes, due to material being transported down the slopes and deposited near the base. Where iron formation hills rise above the bordering schist or granite areas the canga blanket extends out over these areas. The best grade of canga occurs on the iron-formation areas, especially where ore occurs with the itabirite. Frequently such canga is made up, to a large extent, of irregular fragments of ore cemented by limonite and hydrated hematite. The canga overlying areas of other rocks is of lower grade than that overlying iron formation areas, containing a large proportion of impurities such as clay (perhaps containing bauxite, etc.) and silica. The farther away from the iron formation the poorer is the canga, until finally it becames merely an ocherous clay. Over and close to iron-formation areas the fragments in the canga are usually angular, farther away they are small and rounded and finally they disappear. Thus there is every graduation of canga, from ferruginous clay to iron ore with 65 per cent metallic iron. Of the other classes of concentration ores the only ones of importance are rubble ores and leached itabirite.

Rubble ore deposits occur as talus under extensive outcrops of hard ore. They are simply masses of hard ore fragments broken off from the outcrops, and are of the same grade as the bedded hard ore from which they are derived.

Where canga overlies compact thin-bedded itabirite it frequently retains the itabirite texture though most of the silica is removed. This canga *in situ,* exhibiting original textures, is rarely more than a few feet in thickness, being underlain by sandy itabirite. It is leached itabirite. Stream sand and gravel consisting of hematite occur along some of the streams cutting through the iron-formation belts. They are rarely pure enough to be called ore.

Leached carbonate is an earthy material consisting of hydrated iron or manganese oxides, or a mixture of the two. It is derived from the decomposition of impure limestone beds occurring in the upper part of the iron formation and in the lower part of the overlying schist. It is seldom rich enough in iron to be called ore.

In relation to such enormous quantities of high-grade iron ores as exist in Brazil, the principal problem is, of course, that of transportation. For more than 25 years the Central of Brazil Railway, owned and operated by the Brazilian government, has run northward from Rio de Janeiro through the center of the iron ore district. At the present time it continues far to the north to Pirapora on Rio Sao Francisco, from which point it is possible to travel by steamboat and railway to Bahia. The Central of Brazil is a broad gage line from Rio de Janiero as far as Miguel Burnier in the southern part of the iron-ore district, a distance of about 310 miles, and beyond this point it continues northward with a narrow gage. From this point also a branch line runs eastward to Ouro Preto and Marianna while another branch line runs eastward from Sabara to Caethe and Santa Barbara, both in the iron ore district. The latter branch is being continued to Itabira de Matto Dentro. From General Carneiro, north of Sabara, a branch line runs southwestward to Bello Horizonte, the capital and principal city in Minas Geraes. A broad gage line is now being constructed from Lafayette, a station south of the iron ore district, to Bello Horizonte by way of Rio Paraopeba, west of the iron ore district. This will make a direct broad gage connection between Rio de Janeiro and Bello Horizonte.

The Leopoldina Railway has a network of lines in the southeastern part of Minas Geraes and in the neighboring States of Espirito Santa and Rio de Janeiro. Saude, the terminus of one of its northernmost branches, lies about 20 to 25 miles east of the eastern border of the iron-ore district. The Leopoldina Railway has a gage of 1 meter.

The West of Minas Railway has a brench line of 1 meter gage which runs into Bello Horionte from the west. The main line of this road, however, is some distance west of the iron ore district.

The Central of Brazil Railway was not planned as an ore-carrying road. It crosses two divides between the iron ore district and Rio de Janeiro, one south of Barbacena, known as Serra da Mantiqueira, and the other north of Rio de Janeiro, known as Serra dos Orgaos. Heavy grades and sharp curves abound over large portions of the line. The Brazilian government, however, has taken several contracts for hauling iron ore over this road to Rio de Janeiro from points in the western part of the iron ore district at the rate of $1.50 per ton. Small shipments of manganese ore are being transported over the road at the present time, and judging from difficulties encountered in this traffic, it seems probable that much reconstruction will be necessary before this railroad can handle even a small fraction of the iron ores which

(*Continued on page* 742c.)

Reduction of Titaniferous Ores

Details of Interesting Experiments at Port Henry to Utilize Vast Deposits of Magnetic Ores Which Are High in Titanium

BY C J STARK

IN an effort to determine the immediate and ultimate commercial value of the vast body of titaniferous iron ore lying in the Lake Sanford district in Essex county, New York, there has been concluded at the Cedar Point furnace, at Port Henry, N. Y., the most extensive experiments with the smelting of such ore in a modern blast furnace, ever attempted in this country. Brief reference was made to this work in THE IRON TRADE REVIEW, Sept. 3 and this article contains further details.

These experiments form a valuable contribution to the knowledge of the smelting properties of ore of this character, as well as of the manufacturing qualities of pig iron made from this mineral. They have been conducted by the McIntyre Iron Co., which controls the extensive deposits of ore in the Lake Sanford district. This company leased from the Northern Iron Co. for a period of six months beginning Jan. 1, 1914, the Port Henry furnace, with the express purpose of conducting the smelting tests. Owing to various occurrences which delayed the progress of the company's plans, the original lease was extended one month. The lease then expired and the furnace was blown out Aug. 3.

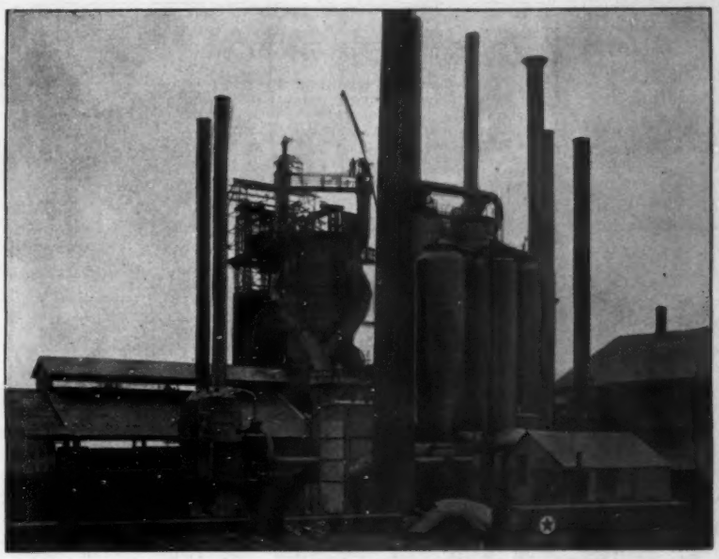


FIG. 1—PORT HENRY FURNACE, WHERE THE TITANIFEROUS ORE EXPERIMENTS WERE CONDUCTED

The difficulties which encompassed the operation of the furnace, particularly in maintaining a supply of titaniferous concentrates on the ground, prevented the lessees of the furnace from carrying out the experiments on the scale originally planned. The furnace was burdened with some proportion of titaniferous ore during approximately only two months of the lease. In all, a total of about 8,000 tons of titaniferous crude ore were put through the furnace in concentrated form, whereas it was hoped at the start that the quantity thus used would be about 30,000 tons. The results that were accomplished in the experimental run with this ore, however, have been satisfactory to the McIntyre Iron Co. and to the furnace managers. The conclusions reached are that titaniferous ores present no extraordinary difficulties in their reduction nor do they impose any especially severe or abnormal effects upon the stack lining or construction. The experiments were in charge of F. E. Bachman, who by reason of his former connection as general manager of the Northern Iron Co., was thoroughly familiar with the Port Henry plant. Geo. L. Shook was superintendent in charge of the furnace. The holdings of titaniferous iron ore of the McIntyre Iron Co. in the Adirondack mountains, in Essex county, N. Y., in what is known as the Lake Sanford district, are on a very large scale and are pronounced in government reports to represent one of the two most extensive and important deposits of this character in the United States. The other leading titaniferous deposit is in Wyoming. The principal ore bodies in the Sanford Lake district are the Sanford Hill, Mill Pond, Iron Mountain and Cheney deposits. Sanford Hill has been considered the largest single property, but late drillings and magnetic surveys indicate the ore body in Iron Mountain is fully as large, if not larger. An early exploration by Prof. Emmons, as given in Bulletin 64, of the bureau of mines, entitled "Titaniferous Iron Ores in the United States," led him to estimate the extent of the Sanford Hill ore body at 6,830,000 tons at a depth of 2 feet below the adjoining surface. The McIntyre company three years ago diamond-drilled the Sanford Hill and Mill Pond deposits, sinking in all 32 holes at an average depth of about 200 feet. This work disclosed a continuous body of ore of the same general character. In an effort to ascertain the depth of the ore body, four holes were put down to a depth of over 800 feet and were still in ore. A magnetic survey of the entire property has indicated that the deposits are connected. With the exception of the Cheney body, the ores are of the same general character, although the Iron Mountain and Mill Pond mineral is coarser grained, somewhat richer and more easily concentrated.

The Sanford Lake district is not tapped by a railroad at the present time. It lies about 30 miles distant by wagon-road from North Creek, N. Y., the terminus of the Adirondack branch of the Delaware & Hudson railroad and about 50 miles southwest of Port Henry. The McIntyre Iron Co. has completed surveys for a railroad from the mines to Fort Ticonderoga on Lake Champlain and has secured the right of way for practically the entire distance. The company also has acquired terminal and dock facilities on Lake Champlain which are expected to be made use of when the state barge canal connecting Lake Champlain with the Hudson river near Troy will be opened for traffic. The grade of the route for the proposed railroad favors the load for the entire distance.

The titaniferous ores of the Lake Sanford district on several occasions, in years past, have been utilized in iron manufacturing. About 1840, a

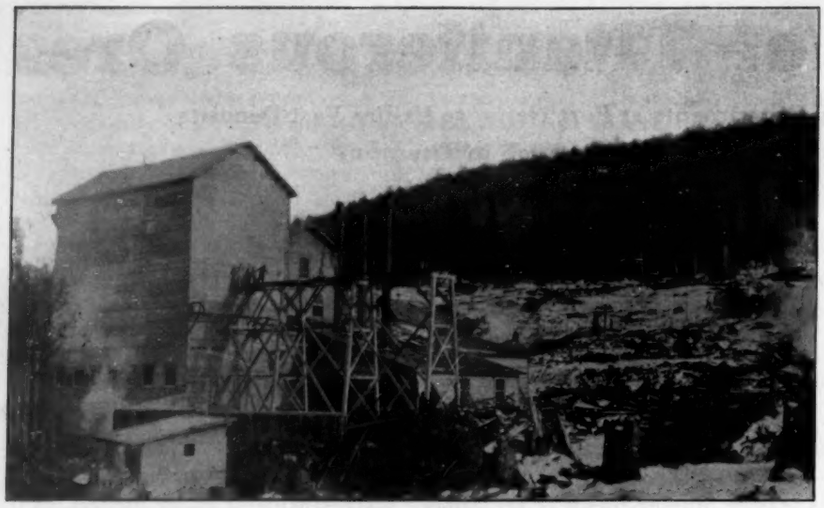


FIG. 2—CONCENTRATING MILL AT THE LAKE SANFORD MINE OF THE McINTYRE IRON CO.

blast furnace of three to four tons daily capacity was built and placed in operation in the district. Later, it was remodeled and enlarged and in 1854, a second furnace of 12 to 15 tons capacity was put in blast. The installation included also puddling furnaces and equipment for making bar iron. The works were abandoned about 1856.

The first Lake Sanford titaniferous ore to be put through the Port Henry furnace, in the experiment just completed, was a lot of 1,000 tons, which was mined about two years ago for the market and then was hauled overland to North Creek, where it remained in stock. When the McIntyre Iron Co. took over the furnace of the Northern Iron Co. for the experiments, this ore was transported to Mineville, six miles from Port Henry and was concentrated in the No. 2 mill of Witherbee-Sherman & Co. At first, it was put through the furnace in one-sixteenth proportion. This was continued for three days, when one-eighth of titaniferous concentrates was used until Feb. 16, when the concentrating mill ran out of crude mineral and the furnace was put back upon its regular mixtures.

A very complete analysis of the crude Sanford Hill ore taken from North Creek and first put on the furnace in concentrated form, gives the following:

	Per cent.
Ferrous oxide	32.01
Ferric oxide	32.24
Silica	5.18
Phosphoric acid	.035
Manganese	.34
Alumina	4.20
Lime	.42
Magnesia	1.86
Titanium oxide	21.02
Vanadium oxide	.35
Chromium oxide	.16
Alkalies	.54
Sulphur	.142
Carbonic oxide	.50
Carbonaceous matter	.16
Combined water	1.41

The metals analyzed as follows:

	Per cent.
Phosphorus	.018
Chromium	.112
Vanadium	.20
Manganese	.26
Titanium	12.61
Metallic iron	47.47
Nickel	trace

TABULAR RECORD OF FURNACE RUN ON TITANIFEROUS ORE.

A complete record of the furnace results during the respective periods is shown in the accompanying table. Titaniferous ore did not begin to figure in the results until the week of June 1 to 8 and then it was included in the furnace mixture for only a part of that period. After June 8, titaniferous ore was used in every charge but in varying proportions.

	Iron Yield, per cent of ore.	Coke, pounds per ton of iron.	Limestone, pounds per ton of iron.	Limestone per cent of ore charge.	Blast, cubic feet per ton of fuel.	Production, tons.
May 1-8, (foundry).....	64.13	2,269	772	22.1	55.6	1,602
May 8-15, (foundry)....	63.13	2,236	807	22.7	53.7	1,636
May 15-22, (foundry)...	63.15	2,328	964	27.2	55.1	1,611
May 22-31, (malleable)..	60.06	2,781	1,376	36.9	58.8	1,881
June 1-8, (malleable)...	56.78	2,260	1,156	29.3	62.5	1,511
June 8-15, (malleable)..	59.87	2,403	1,137	30.4	60.6	1,415
June 15-22, (malleable).	55.55	2,255	987	24.4	63.0	1,369
June 22-30, (malleable).	57.52	2,365	942	24.2	63.2	1,688
July 1-8, (malleable)...	59.16	2,246	810	21.3	61.8	1,466
July 8-15, (malleable)..	57.34	2,354	865	22.1	66.3	1,287
July 15-21, (malleable).	63.40	2,453	1,017	28.7	57.4	1,383
July 21-31, (malleable)*	66.29	2,272	892	26.4	62.0	1,745

*Stock in furnace deducted from materials charged.

FIG. 3—CYCLONE DRILL AT WORK TESTING THE SANFORD HILL DEPOSITS OF TITANIFEROUS ORE

The concentrated product of these ores by the No. 2 mill at Mineville, which was used in making foundry iron from Feb. 6 to Feb. 16, was of the following general character, as shown by two calculations:

	Per cent.	Per cent.
Iron	55.95	56.47
Silica	2.55	2.35
Phosphorus	.003	.004
Manganese	.18	.20
Alumina	3.98	3.68
Lime	.12	.45
Magnesia	1.62	.95
Titanium oxide	11.80	11.83
Vanadium oxide	.40	.415
Chromium oxide	.244	.....
Nickel oxide	.049	.0517
Sulphur	.119	.137

The analyses of five typical casts of foundry iron produced while the furnace was using one-eighth of titaniferous ore, were as follows:

Analysis No.	1	2	3	4	5
Silicon	2.00	1.85	2.50	3.00	2.70
Sulphur	.027	.035	.021	.021	.015
Phosphorus	.632	.609	.62	.642	.65
Manganese	.44	.48	.50	.41	.32
Titanium	.494	.50	.595	.569	.599
Vanadium	.058	.062	.067	.075	.069
Graphite carbon.	3.28	3.23	3.39	3.57	3.47
Combined carbon	.51	.54	.37	.25	.23
Total carbon....	3.79	3.77	3.76	3.82	3.70
Chromium	.038	.035	.039	.036	.038

The furnace slag while one-eighth titaniferous ore was included in the ore burden, as given in representative calculations, shows the following:

Analysis No.	1	2	3	4	5	6
Silica	31.70	29.60	33.00	31.90	30.90	33.00
Aluminum and ferric oxide	14.90	14.95	15.30	13.05	15.10	15.90
Titanium oxide	3.00	4.00	4.65	3.05	2.70	4.50
Sulphur	1.60	2.05	1.75	1.40	2.05	1.80
Lime	40.30					
Magnesia	9.21					

Build Mill at Mine

While the preliminary trials were under way the McIntyre Iron Co. had completed at Sanford Hill an electric concentrating mill, which was intended to prepare the furnace material at the mine. This mill, however, did not prove successful, as it was discovered when operations began that the crushing and rolling equipment, was not heavy enough to render the hard ore sufficiently fine to obtain satisfactory results. Accordingly, an arrangement then was made with Witherbee, Sherman & Co., to concentrate in their mills at Mineville near the furnace such quantities of Sanford Hill ore as were to be used in the tests. This plan was continued until the end of the furnace run and in that time about 7,000 tons of the Lake Sanford crude mineral, were electrically cobbed at Mineville and smelted in the blast furnace. This tonnage of crude ore was hauled on sleds through the snow from the mines to Newcomb, N. Y., the end of the state road, a distance of 12 miles. Logging locomotives were used to draw these trains of sleds through the snow. From Newcomb, the ore was transported in automobile trucks over the state road to North Creek, a distance of 18 miles. As far as known, this was the first time that auto trucks ever have been employed to serve as iron ore carriers. The details of this transfer were given in THE IRON TRADE REVIEW, Sept. 17, 1914. At North Creek the ore was shipped to the concentrators at Mineville over the Delaware & Hudson railroad. Various delays attended the transportation of this block of crude ore from Sanford Hill to North Creek and it was not until May 20, that the mills finally began to receive the shipments in quantity.

At first, the ore was concentrated in Witherbee, Sherman & Co.'s No. 1 mill and this plan was followed until both the Nos. 1 and 2 mills were destroyed by fire the latter part of June. The ore then was shifted to the No. 4 or Barton Hill mill, one of the most modern at Mineville, which completed the separation of the block of crude mineral.

An analysis of the concentrate from the No. 1 mill, is as follows:

	Per cent.
Iron	64.82
Silica	2.70
Phosphorus	.004
Manganese	.22
Alumina	4.98
Lime	.15
Magnesia	1.87
Titanium oxide	13.98
Vanadium oxide	.546
Chromium oxide	.280
Nickel oxide	.0475
Sulphur	.137

Typical examples of the concentrates from the No. 4 mill, showed the following metallic iron and titanium oxide contents:

	Per cent.	Per cent.
Iron	54.72	55.11
Titanium oxide	13.09	13.34

In the meantime, the concentrated product of about 1,000 tons of crude ore, which had been separated at the Sanford Hill mill before the latter was abandoned, had been shipped to the furnace and later this lot was mingled with the concentrates from the Mineville mills and smelted in the course of the run.

The concentrates from the Sanford Hill mill analyzed as follows:

	Per cent.
Iron	54.11
Silica	2.50
Phosphorus	trace
Manganese	.17
Alumina	4.60
Lime	.45
Magnesia	1.79
Titanium oxide	13.78
Vanadium oxide	.629
Chromium oxide	.35
Nickel oxide	.0538
Sulphur	.123

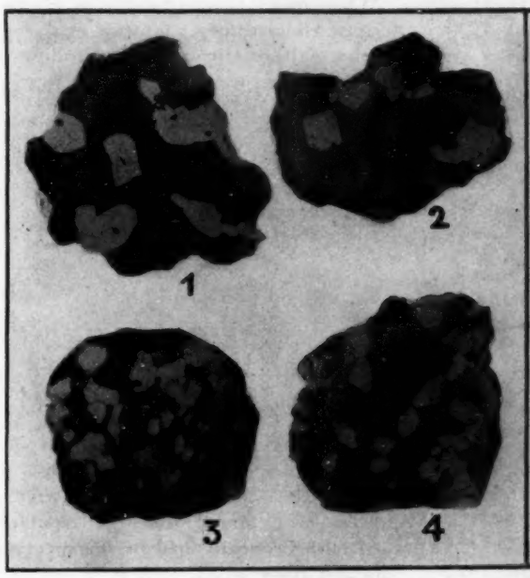


FIG. 4—SAMPLES OF IRON MOUNTAIN AND LAKE SANFORD ORES, POLISHED ETCHED AND MAGNIFIED TWO DIAMETERS. NOS. 1 AND 2 ARE IRON MOUNTAIN AND NOS. 3 AND 4 LAKE SANFORD ORE. THE LIGHT GRAINS ARE ILMENITE AND THE DARK ONES, MAGNETITE

FIG. 5—MINING TITANIFEROUS IRON ORE AT THE SANFORD HILL DEPOSITS

The various difficulties and delays in putting the titaniferous ore into concentrated form, consumed so much time that it was June 3 before the experiments of the furnace could be resumed. From that date until July 30, when the furnace lease expired, there was an uninterrupted run with a burden of various proportions of the titaniferous concentrates, mixed with Witherbee, Sherman & Co.'s concentrates. In the interval between the end of the first short experiments, Feb. 16 and their resumption June 3, no repairs were made to the furnace.

On June 3, the furnace resumed its run with titaniferous ore, using one-eighth proportion and was changed from foundry to malleable iron. This mixture continued from June 3 to June 5, when the proportion of titani-

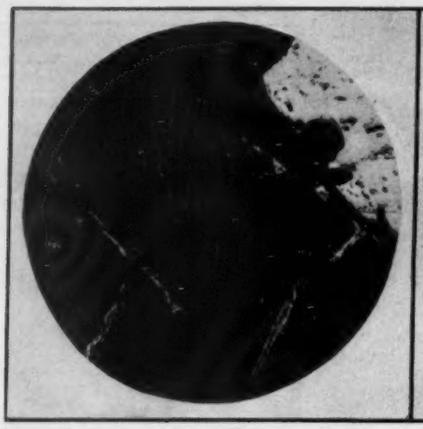


FIG. 6—SAMPLE OF IRON MOUNTAIN ORE, MAGNIFIED 20 DIAMETERS. THE LIGHT GRAINS ARE ILMENITE AND THE DARK ONES MAGNETITE

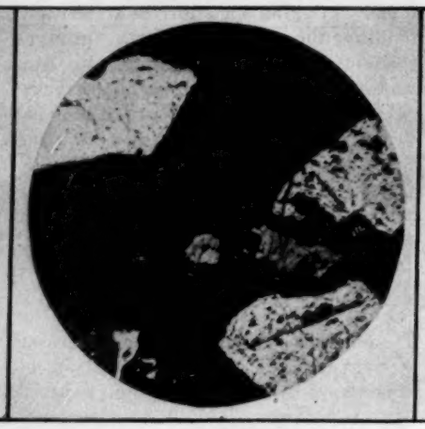


FIG. 7—SAMPLE OF LAKE SANFORD ORE MAGNIFIED 20 DIAMETERS. THE LIGHT GRAINS ARE ILMENITE AND DARK ONES MAGNETITE

FIG. 8—SAMPLE OF IRON MOUNTAIN ORE MAGNIFIED 100 DIAMETERS, SHOWING BOUNDARY BETWEEN LIGHT ILMENITE GRAINS AND DARK MAGNETITE GRAINS

ferous ore was raised to three-sixteenths and remained until June 9, when it was further increased to one-fourth. The run on a one-fourth mixture lasted from June 9 to July 12. On the latter date, five-sixteenths of titaniferous ore was put on and this continued until the furnace was blown out.

With one-eighth titaniferous ores, random casts of malleable iron showed the following:

	Per cent.	Per cent.	Per cent.
Silicon	1.10	.90	.80
Manganese	.52	.42	.47
Phosphorus	.168	.174	.166
Sulphur	.023	.025	.027
Titanium	.178	.468	.436
Vanadium	.053	.048	.048

The slag under the same burden showed:

	Per cent.	Per cent.
Silica	34.80	31.10
Alumina and iron oxide	10.72	10.10
Titanium oxide	4.68	2.58
Sulphur	1.55	1.70

On a mixture of three-sixteenths titaniferous ore, the malleable iron produced was as follows:

	Per cent.	Per cent.	Per cent.
Silicon	.95	1.05	.77
Manganese	.51	.48	.47
Phosphorus	.165	.176	.152
Sulphur	.023	.038	.029
Titanium	.574	.394	.493
Vanadium	.071	.058	.071

The slag analyses were as follows:

	Per cent.	Per cent.
Silica	29.00	29.70
Alumina and iron oxide	9.90	7.82
Titanium oxide	2.96	3.22
Sulphur	1.75	1.85

On the longer run from June 9 to July 20, with one-quarter titaniferous ore, the casts of the malleable iron were as follows:

Analysis No.	1	2	3	4
Silicon	.95	1.00	1.30	1.35
Sulphur	.025	.023	.029	.015
Phosphorus	.132	.196	.176	.290
Manganese	.53	.68	.59	.21
Titanium	.628	.449	.332	.395
Vanadium	.066	.066	.080	.080

The slag ran as follows:

	Per cent.	Per cent.	Per cent.
Silica	30.60	29.70	33.90
Alumina and iron oxide	10.74	13.75	12.29
Titanium oxide	7.10	5.65	6.02
Sulphur	1.65	1.80	1.65

When using five-sixteenths of titaniferous concentrates, typical analyses of the malleable iron were as follows:

	Per cent.	Per cent.	Per cent.
Silicon	1.50	.70	1.70
Manganese	.50	.42	.40
Phosphorus	.168	.120	.138
Sulphur	.036	.041	.03
Titanium	.494	.34	.456
Vanadium	.108	.106	.114

Slag analyses were as follows:

	Per cent.	Per cent.	Per cent.
Silicon	30.60	29.80	25.40
Aluminum and iron oxide	14.74	13.16	12.38
Titanium oxide	9.19	9.02	10.21
Sulphur	1.70	.....	1.45

Expected Troubles not Realized

Mr. Bachman, the furnace manager, in discussing some of the vagaries of the furnace when operated with titaniferous ores, stated that the troubles which theoretically had been expected, did not materialize.

"None of the troubles which had

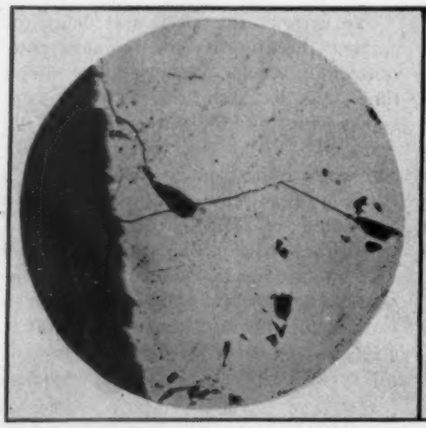


FIG. 9—SAMPLE OF LAKE SANFORD ORE MAGNIFIED 100 DIAMETERS, SHOWING BOUNDARY BETWEEN LIGHT ILMENITE GRAINS AND DARK MAGNETITE GRAINS

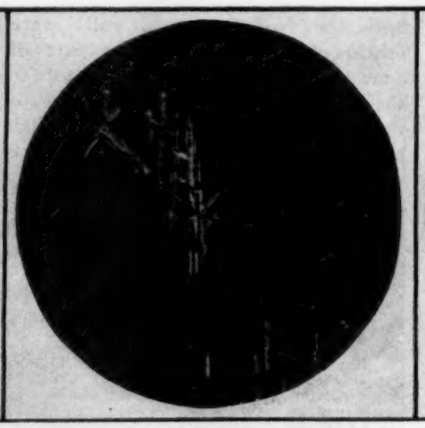


FIG. 10—SAMPLE OF IRON MOUNTAIN MAGNETITE MAGNIFIED 100 DIAMETERS, SHOWING INTERGROWTHS OF ILMENITE

FIG. 11—SAMPLE OF SANFORD HILL MAGNETITE MAGNIFIED 100 DIAMETERS, SHOWING INTERGROWTHS OF ILMENITE

been expected occurred," said Mr. Bachman. "Ever since the furnace had been operated on its present lines, it had shown a decided tendency to hang and slip. Previous to and when the titaniferous ore was charged, both in February and June, the furnace was hanging and slipping seriously. In both cases, within 48 hours of the ore reaching the tuyeres, the hanging and slipping stopped and the furnace worked exceedingly regular until July 15, when we began charging stock coke, which had been piled in the open for 18 months or more. While using this coke, which continued until the end of the run, the furnace seriously tightened and there was a recurrence of the slipping troubles. In February, immediately on the titaniferous ore reaching the tuyeres, the slag became excessively fluid and remained so throughout the run. This excessive fluidity, together with weather conditions, which made it impossible to flush and cast at regular periods, caused us many times to carry an excessive amount of cinder in the furnace. This resulted in a cutting action on the tuyere circle, which showed a decided increase in the temperature of the lower bosh and tuyere circle plates, and resulted in four cinder break-outs in this section of the furnace. The tuyere breasts in use at this time were 5 inches shorter than those for which the furnace had been designed. Previous to the resumption of the use of the ore, longer breasts were placed in the furnace and during the June and July run, there was no recurrence of cinder break-outs.

"During February, no iron was produced in which the sulphur was in excess of 0.05 and in but one cast was sulphur in excess of 0.05 during June. During June and the early part of July, the slag showed a decided tendency to hang at the tuyeres. The furnace had all the appearance of a 'dirty hearth' and the coke consumption fell off in proportion to the wind blown. At first, I was under the impression that the cinder at the tuyeres was due to a boiling condition in the hearth, thinking that probably titanium oxide was being reduced by direct contact with the coke and by the production of carbon monoxide gas. Subsequently, through an increase in the tuyere length and an increase in the amount of the wind blown, enabling the furnace to burn the normal amount of coke, it was found that the cinder settled from the tuyeres normally. The indications, therefore, are that the melting point of the titaniferous slag was lower in the furnace and that when it was raised slightly by increasing the air blown, the cinder reached the tuyeres fully melted and lost its sticky condition. I can only account for the falling off in the coke burned per cubic foot of wind blown on the theory that there was less consumption of coke by direct reduction of solid carbon in the upper section and that more coke reached the tuyeres."

The flux used in the furnace during its run, was varied considerably. From June 3 to June 20, the charge consisted of 75 per cent calcite and 25 per cent dolomite; from June 20 to July 6, one-half calcite and one-half dolomite; from July 6 to July 16, 25 per cent calcite and 75 per cent dolomite; and from July 16 until the furnace was blown out, one-half calcite and one-half dolomite.

"The slags with 75 per cent calcite and 25 per cent dolomite, were slightly more fluid than the slags made when smelting non-titaniferous ores, using one-half calcite and one-half dolomite, which has been the standard practice of the furnace," says Mr. Bachman. "The increase to one-half calcite and to one-half dolomite, when using titaniferous ores, slightly increased the fluidity of the slag. When the dolomite was raised to three-fourths of the charge, there was a further increase of the fluidity of the slag and a greater tendency to high sulphurs than with the one-half or one-fourth proportions. In a general way, my observation of the slag temperature indicated that it averaged about 100 degrees Fahr. more than was shown before the titaniferous ores were put on. The observations of slag temperature, previous to the using of the titaniferous ore, however, covered so short a period, that this cannot be stated with certainty. My conclusions are that the slag will carry a little more sulphur with titanium without the sulphur going into the iron, as compared with ordinary practice. I think this is due to the fact that titanium is not as active an acid agent as silicon."

On the condition of the furnace after blowing out, Mr. Bachman says:

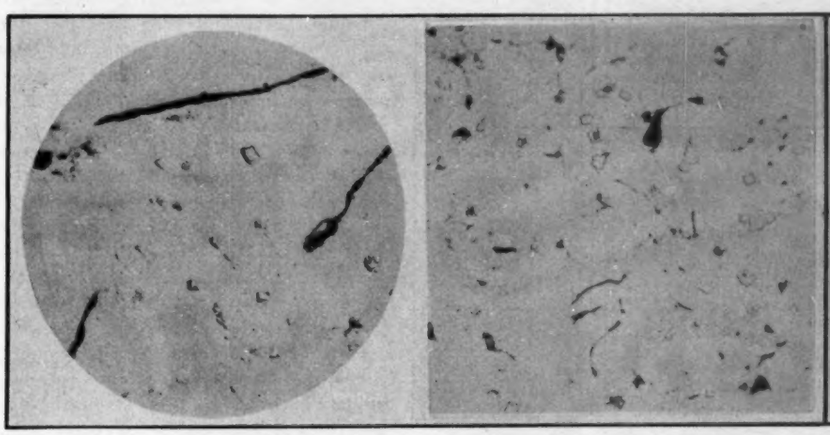


FIG. 12—TITANIFEROUS PIG IRON MAGNIFIED 400 DIAMETERS. SAMPLE IS UNETCHED

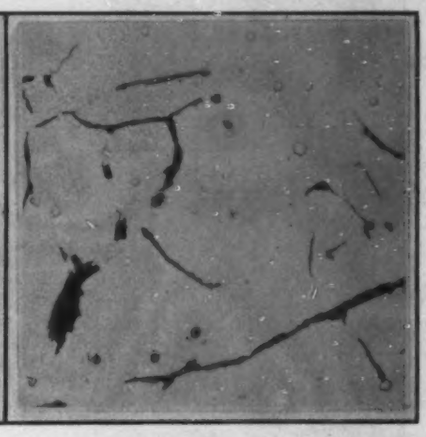


FIG. 13—ORDINARY PIG IRON MADE WITH PORT HENRY ORES AND CONTAINING VERY LITTLE TITANIUM. SAMPLE IS UNETCHED AND IS MAGNIFIED 400 DIAMETERS

"Nitrocyanide of titanium was looked for very carefully, but none could be found in any place, with the possible exception of a few copper-colored crystals which one of the foremen reported having seen in the layer of fused brick in the extreme bottom. However, he did not retain this so that the presence of this compound in any portion of the hearth is uncertain.

"Samples of material from the various layers were submitted to the Fitzgerald Laboratories, Niagara Falls, N. Y., with the request that they determine their melting points. The laboratories reported as follows:

First layer, 2,372 degrees Fahr.; second layer, 2,570 degrees Fahr.; inner layer, 2,642 degrees and outer

layer 2,498 degrees. The temperature of slag flowing from the furnace was observed during the run and was found to range from 2,460 to 2,885 degrees Fahr. These temperatures were read with an optical pyrometer, as the cinder flowed from the runner into the cinder ladles.

"The condition of the furnace above the tuyeres, beginning at the top, was as follows: The top bricks were cut back a maximum of 8½ inches and a minimum of 6½ inches. The inwall brick showed a wear of 4½ inches maximum above the mantle. On the thin wall section from the mantel to the top of the bosh, where the lining was originally 13½ inches thick of hearth and bosh quality brick, the bricks were cut back till practically none remained. They were replaced on the upper 8 feet with the usual carbon coating ranging from 2½ to 3½ inches in thickness. Below the 8 foot point, this carbon coating gradually increased in thickness, until at the top of the bosh, it was 6 inches. This thickness was maintained until immediately above the tuyeres, where it gradually thickened to the original 18 inches at the tuyere circle. The original thickness of the brick at the bosh was 9 inches. There, however, was a small section of the bosh immediately over the iron notch and above the No. 1-12 tuyeres, which had been planked for a long time previous to blowing out, where the carbon coating reached from 18 to 24 inches in thickness on the bosh walls.

"After blowing out, a distinct ring was noted, attached to the carbon lining at a point 17 feet above the tuyeres. This ring was 6 to 8 inches thick and about 1 foot high. About 36 hours after the wind was off, it fell with the exception of a section of about 5 feet in length, breaking into coke and dust. This 5 foot section seemed to have been attached to the carbon coating more tightly, as on its removal, a smooth wall showed behind it. The furnace had been blown down to a level 3 feet below the bottom of the ring referred to. From this point to the tuyeres, some coke adhered to the carbon coating. On its removal, a smooth wall was shown behind it. Whether or not this was in place before the furnace was blown out, I am not able to judge. In no place was it over 12 inches thick."

The results shown in the making of foundry iron with one-eighth of titaniferous ore in the mixture, have been satisfactory. Mr. Bachman expresses the opinion, however, that with a mixture of 25 per cent titaniferous ores running 13 per cent in titanium oxide, it would be more difficult to make pig iron with silicon running over 2 per cent. It appears that the tendency of titanium is to replace the silicon in the iron. It is found that in the use of larger proportions of titaniferous ore than one-eighth, the silicon in the iron, plus half the titanium, equal about what the silicon should be from the use of ordinary ores under proper furnace conditions. Mr. Bachman is of the opinion that some titanium in the iron comes from the coke used. He expresses the belief that the average iron made from Lake Superior ores and Connellsville coke, will run between 0.10 and 0.20 per cent in titanium and between 0.01 and 0.02 per cent in vanadium, acquiring these last two elements from the fuel used.

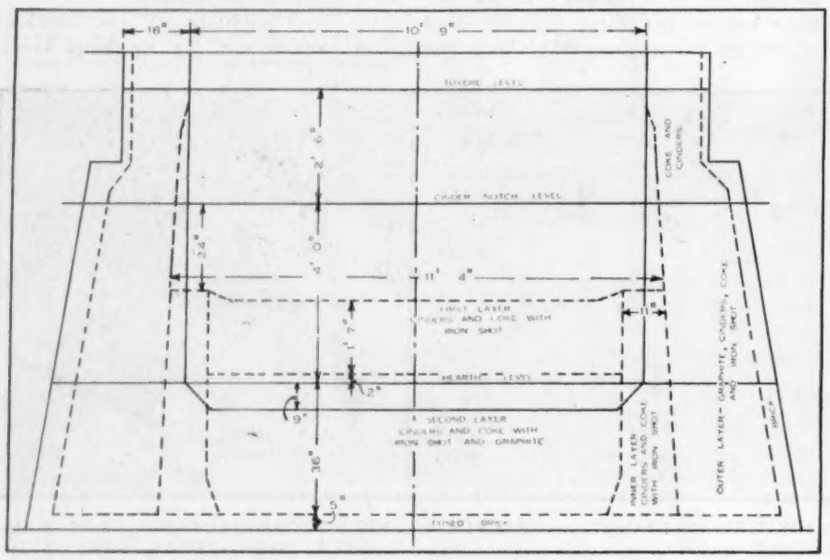


FIG. 14—SKETCH SHOWING DEPOSITS IN FURNACE AT END OF RUN

The tests reported from the use of the foundry iron made when the furnace was using from one-sixteenth to one-eighth of titaniferous ore, have been the most complete of any yet made and the results have been generally satisfactory. A new England consumer reported that using 25 per cent of this iron in place of another brand in his mixture, he increased the breaking point of a Keep ½-inch test bar, from 465 to 575 pounds. The strongest bar that had been known previously in the history of this shop was 505 pounds.

The McIntyre Iron Co., itself, conducted a number of experiments with the foundry iron. In a series of tests with 1¼-inch bars, the breaking point on the average was shown to be 50 pounds greater than in the case of iron of corresponding silicon, which contained no titaniferous pig. The breaking of these bars was done by the Titanium Alloy Mfg. Co., Niagara Falls. These tests covered irons of a considerable range of silicons. Five different casts of the titaniferous iron and a similar amount of Buffalo iron corresponding in phosphorus and silicon, were taken and melted separately. Test bars were made from this metal. The two irons, titaniferous and non-titaniferous, then were mixed with 50 per cent of stove plate scrap and test bars made. The entire 20 bars—those from all pig iron and those from the mixture of iron and scrap—then were tested. In every case but one, the titaniferous iron proved the stronger. In every instance where the iron was mixed with scrap, its strength was superior. A mixture of one-half scrap and one-half of the non-titaniferous iron, broke at a lower transverse strength than the same pig iron unmixed with scrap. Titaniferous iron mixed with the same amount of scrap broke at higher point than the pig iron alone. The chill on the remelted Buffalo iron with 2.50 per cent silicon, was practically identical with that of the titaniferous iron at 1.80 per cent silicon. This applied both to the all-pig bars and to the half-scrap and half-pig bars.

This increase in the strength of titaniferous iron as against ordinary foundry iron, while very interesting, is not considered of material importance, inasmuch as it does not represent over 5 per cent of the average. The conclusions reached from the reports of various foundries which have used the metal, are that foundry irons containing titanium will carry more scrap without chilling than iron of the same silicon which contains no titanium and will make softer

(*Continued on page* 742c.)

A Study of Bark on Tool Steel

An Investigation of the Phenomenon of Surface Decarbonization and Its Effect on Cutting Tools

BY J V EMMONS

IT HAS long been know that the outside skin of tool steel frequently exhibits properties widely different from the interior of the mass. Within the last few years it has been generally recognized that many of these properties were due to surface decarbonization. The origin and effects of this altering of the composition have been but little studied.

The decarbonization of steel is of great practical interest to every user of tool-steel products. With but few exceptions, all tool steel furnished by the makers shows decarbonization to a greater or less degree. This is the result of various heating processes during manufacture. The decarbonized surface, or "bark", as it is commonly called, must be removed before the steel is used for cutting tools, wearing surfaces, etc. The depth of bark may vary greatly owing to oxidizing conditions during the hammering, rolling and annealing of the rough material.

The most common method of inspection consists of hardening a piece of the material, breaking and examining the hardened fracture by means of the naked eye or hand magnifier. The bark is thus distinguished by its fracture being coarser than the high-carbon interior. To examine the reliability of this method the following experiment was performed:

A bar of ½-inch round crucible steel was selected, having the same composition as the one used in the previous series of experiments. It was annealed and examined microscopically. The bark was found to be approximately 0.015-inch in depth. Pieces were cut from this bar and hardened at various temperatures. Microscopic examination was then made of a piece hardened at each temperature, the decarbonization being measured to the point where the normal structure of the interior began.

The depths of bark shown by the microscope on the various pieces were as follows:

Piece No.	Temperature of hardening, Fahr.	Depth of bark inches.
1	1,370	0.015
2	1,380	0.018
3	1,390	0.018
4	1,415	0.018
5	1,435	0.021
6	1,460	0.020
7	1,490	0.024
8	1,530	0.027

The increase in the amount of bark observed with the increase in temperature is, of course, due to the fact that an increased amount of cementite is held in solution by quenching from the higher temperatures.

The examination of the hardened fractures gave the following results: No. 1 was only slightly hardened. The bark scarcely shows at all in the fracture; No. 2 gives only a very slight indication of bark; No. 3 gave no indication of bark, and No. 4 very slight indication of bark; No. 5 bark shows more distinctly but only in spots; No. 6 bark shows fairly distinctly; No. 7 bark very distinct; in No. 8 the fracture of the interior has become so coarse that there is no distinction between it and the bark.

This method of inspection is, therefore, reliable only when the hardening heats are carefully regulated and the results frequently checked by microscopic examination.

The method of inspection which the author has found to be the most satisfactory is by microscopic examination of an annealed specimen. The amount of carbon present and the exact condition of the bark can be determined very readily. Measurements of the depth of decarbonization may be made with a micrometer eye piece.

In the machining of tool steel, bark presents serious difficulties. It is a well-known fact among machinists that the tool steel is frequently very difficult to machine near the surface. Also that after this hard bark is removed very little difficulty is encountered. This condition is almost in-

(*Continued on page* 742b.)

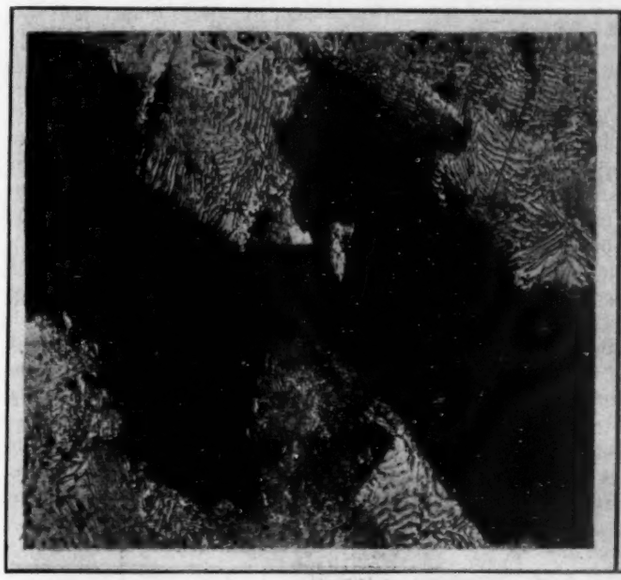


FIG. 1—CRACK CAUSED BY TOOL IN COARSE PEARLITE

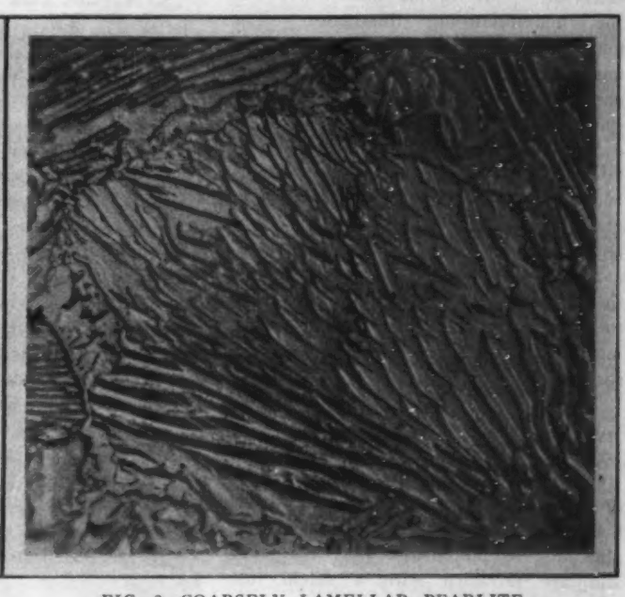
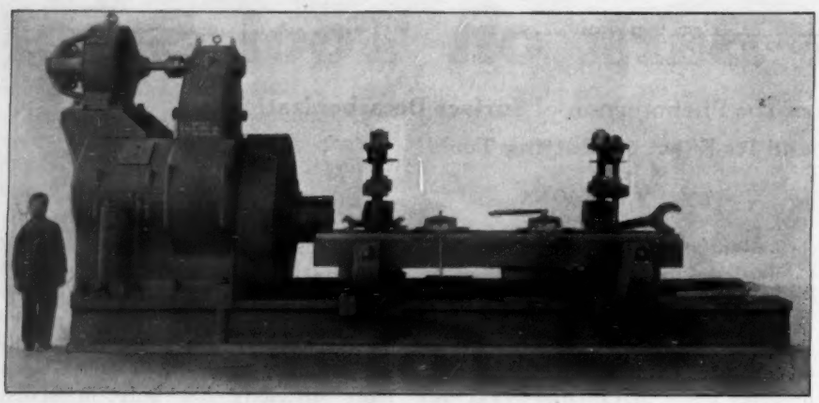


FIG. 2—COARSELY LAMELLAR PEARLITE

Portions of a paper read at the Pittsburgh meeting of the American Institute of Mining Engineers, Oct. 8-10, 1914.



HEAVY DUTY ROLL TURNING LATHE

Heavy Roll Turning Lathe

The United Engineering & Foundry Co., Pittsburgh, recently has designed a heavy-duty roll turning lathe, shown in the accompanying illustration. The machines are built in several sizes ranging from 18-inch to 50-inch swing. They are provided with motor drive, with speed adjustments of four to one or of eight to one, and also are built for belt drive. These lathes are of unusually heavy construction and are designed to give great power, at the same time eliminating vibration and chatter. All parts are accessible and, it is stated, the cost of upkeep is reduced owing to the large size of the bearings and wearing parts. The bed plates are massive castings of box section.

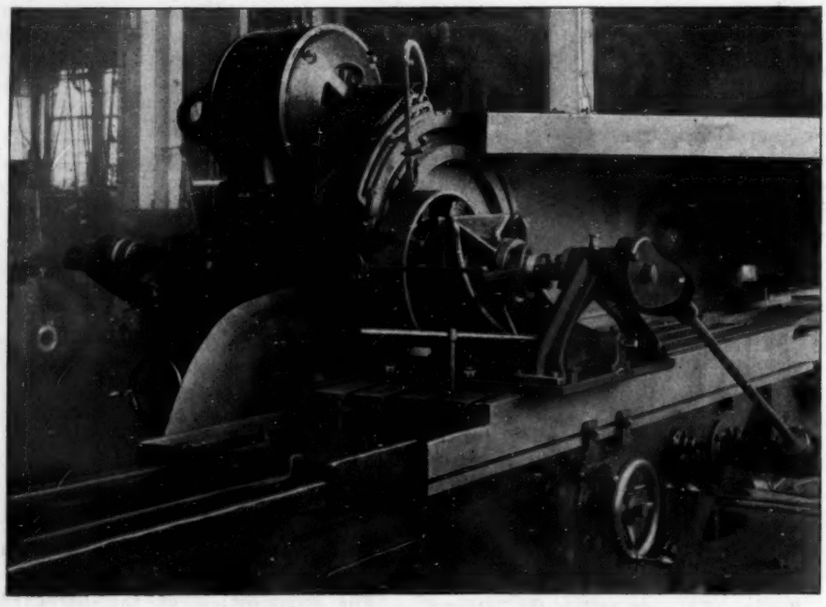
The headstocks are of the enclosed type, and are made oil tight, but are so arranged that any one of the shafts with its gears can be removed without difficulty. All gears run in an oil bath. The internal gear of the face plate and its pinion also have cut teeth, and are provided with a shield into which grease may be packed for lubrication. All the shaft bearings are bushed with removable babbitt shells, and are continually flooded with oil by splash lubrication, as in automobile transmission.

The driving motor is mounted directly on top of the headstock. The latter is of the enclosed type and forms a rigid support for the motor, the size of which, with the large gears, bearings and heavy construction, amply provides for the extra heavy duty required of roll lathes in modern roll turning practice. The location of the motor does not interfere with the accessibility of the interior of the headstock.

It is possible to turn two rolls at once with this type of lathe. One roll may be rough turned while another is being finished, without inconveniencing the operator. The lathes are accompanied by several types of housings, suitable for handling various classes of rolls and they may be equipped with top bearings for matching or crossing rolls, if desired.

Chuck for Grinding Machine

The Diamond Machine Co., Providence, R. I., recently has perfected an attachment which is used in connection with its face grinding machine for finishing circular work, such as piston rings or pipe flanges. The attachment may also be used for finishing other small pieces which could be held on a magnetic chuck. The attachment consists of a chuck which is bolted to the table of the machine, as shown in the accompanying illustration. The chuck is driven by the main motor through a splined shaft and bevel gearing. It is provided with a throw-out clutch so that it may easily be stopped and started. The attachment is so constructed that it may quickly be removed from the machine.



SPECIAL CHUCK FOR GRINDING MACHINE

Test of Hack Saw Blade

An interesting test of an Atkins 18-inch power hack saw blade recently was made in a large automobile factory, Detroit. The blade cut 10,000 pieces of ⅞-inch round cold rolled stock and was still in fair condition at the end of the operation. After the first thousand cuts were made, a piece of material accidentally fell on the blade and broke it. It was welded by the oxy-acetylene process and 3,000 additional cuts were made when a similar accident broke the blade in a second place. This break was welded and 6,000 more cuts were made before the blade was finally discarded. During this operation the blade was re-sharpened by grinding the teeth on an ordinary tool room grinder three times.

An attractive 16-page catalog has been issued by the Compressed Gas Machinery Co., Buffalo, describing a line of oxygen and hydrogen gas plants for use in connection with the supply of gas for welding or other purposes. The catalog contains an interesting review of progress in the development of gas making apparatus and concludes with a detailed description of the Surth system, which is utilized in the apparatus manufactured by the Compressed Gas Machinery Co.

The Brown Instrument Co. will occupy its new factory at Wayne and Windrim avenues, Philadelphia, in a few days. The building is two stories in height and will be completely equipped for manufacturing and calibrating scientific instruments. A power plant will be installed.

Mining Engineers at Pittsburgh

Important Papers Read Under Auspices of Iron and Steel Committee—Rail Mill and Blast Furnace Problems Bring Out Lively Discussion

IT WAS only fitting that papers bearing on iron and steel manufacture should occupy a prominent place on the program of the fall meeting of the American Institute of Mining Engineers, held at the Schenley Hotel, Pittsburgh, last week. The meeting extended over three days, from Thursday to Saturday, on two of which there were special sessions under the auspices of the iron and steel committee of the institute. During these sessions nine papers on iron and steel topics were presented, and in addition two more were read at the opening sessions Thursday afternoon. The iron and steel committee, under the leadership of Prof. Albert Sauveur, is to be congratulated on the variety of the papers and the interesting character of the discussions given under its supervision. The discussions were complete and spirited and form valuable supplements to the papers; in addition, the discussions indicated a rapidly growing interest in iron and steel topics among the members of the American Institute of Mining Engineers. The progressive, modern mining engineer wishes to be thoroughly informed not only on iron ore mining, but also in regard to the various processes involved in the transformation from ore to finished products.

The opening session took place Thursday afternoon, Oct. 8, in the lecture hall of the Carnegie museum. Benjamin B. Thayer, president of the Institute, was in the chair. In an address of welcome, Dr. W. J. Holland, director of the Carnegie museum, mentioned the fact that Pittsburgh is the center of the radium industry in the United States, and he called especial attention to the unusually complete collection of radium specimens in the possession of the Carnegie museum. Immediately after the address of welcome, the following papers were read and discussed: "The Occurrence, Preparation and Use of Magnesite", by L. C. Morganroth; "The Oil Fields of Mexico", by Ezequiel Ordonex; "The Iron Industry in Brazil," by E. C. Harder; "Investigations of Coal Dust Explosions", by G. S. Rice; and "The Appraisal of Coal Lands for Taxation," by H. M. Chance.

As will be observed by the titles, two of these papers are of direct interest to the iron and steel trade. Mr. Morganroth's paper on magnesite, which will be published in full in a later issue of THE IRON TRADE REVIEW, describes the magnesite deposit known to exist in various parts of the world, with particular reference to the Austrian quarries. The paper also touches on the methods employed in preparing crude magnesite for industrial purposes. The discussion which followed the reading of this paper indicated that the American representatives of the Austrian magnesite interests do not expect any serious difficulties as the result of the war in Europe. Although ocean freights are a little higher, it was asserted that importations are being made freely and little danger of a shortage exists. Nevertheless, the trouble in Europe has centered attention on the California deposits. These may be considered as a possible reserve supply, but the consensus of opinion was that the domestic magnesite deposits cannot be given serious commercial consideration at present on account of lack of transportation facilities and other disadvantages. The American magnesite is much more difficult to prepare than the Austrian variety, owing to the fact that it occurs in a purer state. In calcining, California magnesite it has been found very difficult to drive out the last 2 per cent of carbon dioxide. It was pointed out that the freight on the Austrian magnesite to Atlantic coast ports is from $4.00 to $5.25 per ton, whereas the freight on the California variety through the Panama canal would be from $9 to $10 per ton.

Mr. Harder's paper on Brazilian iron ores is published elsewhere in this issue. In discussing the paper, Dr. Isaac C. White state geologist for West Virginia, said that most of the ores of Brazil will have to be exported on account of a lack of suitable fuel near at hand. The best Brazilian coking coal is said to contain 35 per cent ash and 6 per cent sulphur. This coal can be washed and made into briquettes, in which form it contains 12 per cent ash and 0.6 per cent sulphur. In this form it might be utilized for the manufacture of iron, but at the present time the iron and steel consumption of Brazil does not justify the establishment of manufacturing plants on a sufficiently large scale to be profitable.

A very interesting discussion followed the reading of a paper by G. K. Burgess, J. J. Crowe, H. S. Rawdon and R. W. Waltenburg on "Finishing Temperatures and Properties of Rails." The authors are connected with the United States Bureau of Standards. This paper, which was summarized in the Sept. 3 and Oct. 1 issues of THE IRON TRADE REVIEW, states that it is not difficult to determine finishing temperatures of rails without delaying manufacturing operations. The results of the observations show that the shrinkage clauses in rail specifications do not serve their avowed purpose of limiting the finishing temperature to a value slightly above the critical point. The paper includes a great deal of valuable data in regard to physical properties of rail steel.

The chief points brought out by the discussion are that more attention should be given to the temperature at which rails are rolled, but in order to proceed on a scientific basis more data regarding the correct rolling temperatures are necessary. Prof. Sauveur stated that rolling temperatures have a profound influence on the structure of the material. He also suggested that rail consumers should insist on proper temperature control during manufacture. Dr. P. H. Dudley, of the New York Central Lines, called attention to the great increase in rail failures in 1912, as compared with 1911 and 1913, owing to the exceptionally severe winter in 1912-13. Weather conditions have a very appreciable influence on the duration strain factor. A rail, said Dr. Dudley, must be considered both as a girder and from a standpoint of wear resisting qualities. Service tests, he said, have not sustained the contentions of the advocates of extreme cold rolling. Temperature control is important, but the proper temperature ranges have not yet been accurately determined. R. Trimball, chief engineer of maintenance of way, Pennsylvania Lines West, stated that the railroads want lower rolling temperatures, but the mills prefer higher temperatures because they are easier on the rolls. M. H. Wickhorst, rail expert of the American Railway Engineering Association stated that a few years ago rail failures were generally attributed to too hot rolling. Later investigations, however, have proved that this theory was false. He agreed with the author of the paper that shrinkage is not a good measure of finishing temperature, but stated

that he was unable to find any definite law governing the relation of grain size to rolling temperature. Edward F. Kenney, Cambria Steel Co., Johnstown, Pa., said that some hot rolled and cold rolled rails were placed in the horseshoe curve on the Pennsylvania railroad and the results showed that there was no difference in their wear resisting qualities. He also stated that drop tests did not indicate any difference between hot and cold finished rails.

A Difference of Opinion

Richard A Rice, General Electric Co., West Lynn, Mass., submitted a paper entitled "Turbo-Blowers for Blast Furnace Blowing." Since the first installation of turbo-blowers, at the Oxford, N. J., plant of the Empire Steel & Iron Co., in 1910, said the author, the total number of blast furnace blowing engines of this type in use has grown to 12. Mr. Rice submitted data describing the methods followed in designing such apparatus and he also told about the cost of operation. In his opinion, he said, the turbo-blowing engine gives a steadier blast and a better measurement of blast than any other type of blast furnace blowing apparatus; furthermore, this steadier and better measured blast brings about better conditions in the furnace, resulting in increased output as well as improved quality of the output. The fewer the number of furnaces in a given blast-furnace plant, he said, the more considerable are the advantages presented by the use of the turbine driven units.

The discussion indicated that the differences of opinion between the advocates of the turbo-blower and the reciprocating blowing engine are as irreconcilable as ever. Both sides were ably represented. S. G. Vallentine, Oxford Furnace, Oxford, N. J., submitted a written discussion in which he stated that their turbo-blower has been running continuously for about two years, during which time no serious mechanical difficulties have been encountered. Furthermore, the operation of the furnace has been very regular, due, it is believed, to the uniform air supply furnished by the turbo-blower. For a long period from 90 to 93 per cent of the total output has been standard basic pig made from magnetite ore rather high in sulphur. Expense for repairs, oil and waste has amounted to about 2 mills per ton of pig iron produced.

Mr. Iverson, chief engineer, Mesta Machine Co., Pittsburgh, disputed the author's figures and presented a calculation showing that the turbo-blower operating under the conditions mentioned by Mr. Rice, would require 32 per cent more gas. He also stated that no increase in furnace efficiency was observable due to the alleged uniform output of the turbo-blower. Other speakers pointed out that the turbo-blower depends on a high vacuum for efficiency, which cannot be maintained at many iron and steel plants. One speaker said that with 26-inch vacuum on the reciprocating engine and 28 inches on the turbine, the steam consumption would be about the same.

"The plant of the Duplex Process for Making Steel" was the title of a paper read by J. K. Furst, chief engineer of the Pennsylvania Engineering Works, New Castle, Pa. Although the duplex process was practised in Witkowitz as far back as 1878, it has been left to the steel makers of this country to develop it along practical, commercial lines. The American companies manufacturing steel by the duplex process at the present time include the Tennessee Coal, Iron & Railroad Co., Maryland Steel Co., Bethlehem Steel Co., Pennsylvania Steel Co., Jones & Laughlin Steel Co., Colorado Fuel & Iron Co., Lackawanna Steel Co., and Dominion Iron & Steel Co., of Canada. The reasons for manufacturing steel by the duplex process are, briefly, saving of time, increased output for capital invested; and avoiding the difficulty sometimes experienced in obtaining scrap. On account of the latter reason, some plants duplex only at such times as the price and quantity of scrap in the open market warrant. The author described the duplexing plants of the Tennessee, Dominion, Bethlehem and Pennsylvania companies. In conclusion, the author remarked that the process has brought about the development of the Bessemer converting plant to a higher state of perfection and efficiency, has created a desire for larger and better hot-metal cars and mixers and has aided in solving some difficult steel making problems.

Some questions were raised as to whether duplexing has proved a commercial success. With reference to this point, Bradley Stoughton, secretary of the Institute, stated that the duplex process increases the output of the open-hearth furnace very materially, permitting a large production with non-Bessemer ores, thus resulting in financial economy. The duplex process, it was admitted, is more profitable during times of prosperity than when business is slack, since its greatest economies are realized when a large output must be maintained. The duplex process is particularly valuable, it was said, in cases where the quality of the steel must be exactly controlled.

A paper on "Manganese Steel and the Allotropic Theory," which was read by Prof. Albert Sauveur will be published in a later issue of THE IRON TRADE REVIEW, together with a paper on the "Reserves of Iron Ore in the United States," by John Birkinbine.

James C. H. Ferguson, San Francisco, submitted a paper on rolled steel roll shells, which now are employed almost universally in Chilean mills and other types of grinding machinery used in the mining industry. In order to obtain the maximum efficiency from such machinery, he said, it is absolutely necessary that the rolls be provided with good shells, and he set forth in detail the qualities which go to make up a good roll shell. The author described the practice followed in steel plants in rolling roll shells and he submitted data showing the strain such shells undergo in service.

Decarbonization of Tool Steel

A paper on "Surface Decarbonization of Tool Steel," by J. V. Emmons is published in full elsewhere in this issue. The discussion emphasized the peculiar fact that carbon dioxide, under certain conditions, acts as an oxidizing agent, in the same manner as pure oxygen.

In a paper entitled "The Safety Movement in the Lake Superior Iron Region," Edwin Higgins, Pittsburgh, described the relations and functions of the various organizations and institutions engaged in the promotion of safety in iron mines. Ten to 15 years ago, he said, there was practically no organization safety work; during recent years, however, a gradual change for the better has been made. The chief causes of this change have included public opinion; certain state laws which make the operators responsible in dollars and cents for injuries to workman; and the humanitarian attitude of many of the operators, who always have decried the great loss of life in the mines. Practically every mining company in the district now has some individual or organization, whose duties relate solely to safety work, and the region as a whole now stands second to no other metal-mining region in the United States in its efforts to promote the welfare and safety of the miner. There still remains much to be done, however, for the accident records of the Lake Superior mines still compare unfavorably with those of the metal mines of practically all foreign countries. A paper entitled "The New Safety Detonating Fuse" was presented by Harrison Souder.

Simultaneous sessions were held on Friday and Saturday and a large number of valuable papers were presented under the auspices of the coal and coke, the non-metallic minerals, the petroleum and gas, and the electricity

and miscellaneous mining topics committees.

An informal dinner was given at the Schenley Hotel, Friday evening, at which A. Taylor, chairman of the Pittsburgh committee, was toast master. Addresses were made by Benjamin B. Thayer, Bradley Stoughton, Charles E. Rand, E. K. Hiles, Francis H. Phillips, Isaac C. White, Geo. H. Neilson, S. B. McCormick, David T. Day, and E. C. Pechim. On Friday afternoon, excursions were made to various points of interest in the Pittsburgh district, including the Homestead works of the Carnegie Steel Co., the McKeesport plant of the National Tube Co., and the Harbison-Walker Refractories plant.

On Friday evening an informal reception was held at the Schenley, followed by an interesting illustrated address on ancient methods of manufacturing iron in China by T. T. Read. Moving pictures illustrating safety methods in mining also were shown under the auspices of the United States Bureau of Mines.

Mr. Peckitt's Address

Leonard Peckitt, president of the the Empire Steel & Iron Co.,Catasauqua, Pa., addressed the Newark Foundrymen's Association at its opening meeting of the season at the Washington restaurant in that city Wednesday evening, Oct. 7, upon "Blast Furnace Practice". Mr. Peckitt traced the development of the manufacture of pig iron in this country down to the present date and then described the modern methods of manufacture. He outlined the raw materials that enter into the manufacture of pig iron, the localities from which they are derived and described the peculiarities of the various ores widely used in this country. He told of the process for the reduction of these ores and enumerated some of the difficulties of the average furnacemen in producing a marketable product. At the conclusion of his address, Mr. Peckitt was asked and replied to various questions of foundrymen present, pertaining to the subject of the evening.

Taking Bids on Plant

The Hess-Bright Mfg. Co., Philadelphia, now is receiving bids for the construction of an important addition to its plant at Front street and Erie avenue for the manufacture of ball bearings. This company, as stated previously, had imported formerly its supply of bearings from Germany. War conditions having shut off this supply, it now proposes to manufacture its requirements in this country.

Newton Duplex Milling Machine

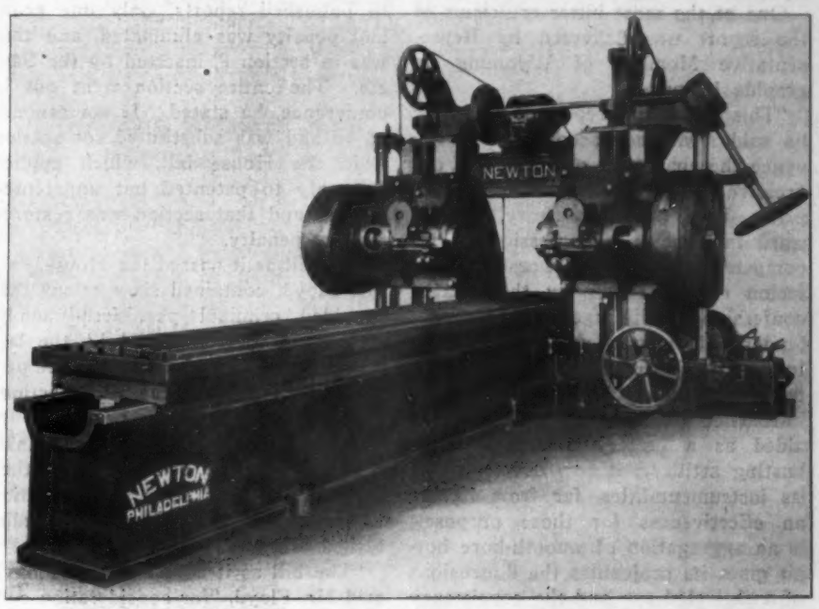
The Newton Machine Tool Works, Inc., Philadelphia, recently has developed a powerful duplex milling machine, designed to finish the sides of tunnel segments at a low cost. As shown in the accompanying illustration, the machine is of the rigid upright duplex type. The drive is so proportioned that either spindle is capable of carrying cutter loads requiring all of the power of a 50-horsepower motor. Under normal working conditions, both spindles are driven by this motor. The drive for the individual spindles is applied in the center of the transmission shaft, insuring rigidity.

The large end of each spindle is 11 inches in diameter. Each spindle has a double taper bearing in the sleeve which has 4 inches of independent hand cross adjustment. A stop, which engages the end of the sleeve, permits of duplication in the depths of cut.

The drive to each spindle is transmitted through a large diameter worm wheel, with a bronze ring and hardened steel worm fitted with roller thrust bearings, both encased for continuous lubrication. Each spindle saddle has both hand and power elevation.

The unusually large diameters of the driving shafts illustrate the massive lines along which this machine is designed. All gears are of steel or bronze with extra heavy teeth. The work table is 30 inches wide and is of sufficient length to mill 16 feet.

The feed and fast power traverse to the table is accomplished by means of a bronze spiral pinion engaging a steel rack. In addition to hand adjustment, nine changes of geared feed ranging from 0.151 inch to 0.157 inch per revolution of spindle and reversing fast power traverse are available. Changes of feed are accomplished through the use of sliding sleeves in the gear box, without removing the gears. The maximum distance between the ends of spindles is 38 inches. The greatest distance from center of spindles to the top of the table is 30 inches. The motor equipment for this machine was furnished by the General Electric Co., Schenectady, N. Y.



NEWTON DUPLEX MILLING MACHINE

The C. & C. Electric & Mfg. Co. Garwood, N. J., maker of generators, motors, electric welding outfits, etc., is operating its plant at half time.

Iron Mining Investigation

Pursuant to a request made to the Dominion government for the granting of some measure of assistance toward the development of iron ore mining in Canada, and in accordance with the statement of the minister of finance in his budget speech during the 1913-14 session of Parliament, that the iron mining industry would be investigated, a committee has been appointed to inquire into the situation.

Every owner or operator of an iron ore property in Canada interested in facilitating this inquiry is requested to communicate with the deputy minister of mines at Ottawa, or the secretary of the committee, who will furnish a schedule of questions covering the information required.

Business News from the Capital

Clayton Bill Vigorously Attacked and Defended Before Being Sent to President Wilson

Washington, Oct. 13.—Attack on the conference report of the Clayton anti-trust bill was as sharp in the House as it was in the Senate. The report, adopted by the House last Thursday by a vote of 244 against 54, was characterized by several Republicans as having taken the "teeth" from the bill, which some termed a "pro-trust measure". The Democrats voted solidly in favor of the report, while 22 Republicans and six Progressives voted with the majority. Republican attacks were met by strong Democratic defenses.

One of the most bitter criticisms of the report was delivered by Representative Mondell, of Wyoming, in graphic language.

"This conference report, if adopted," he said, "will not accomplish in advance the abatement of unfair and oppressive practices in trade and enterprise. It is, on the contrary, a backward movement; a confession of incompetency, if nothing worse; a confusion of the issues by the belated confession of its apologies and defenders. It is now not even claimed to be an effective instrument against trusts and monopolies established and intrenched or hereafter formed. Heralded as a battery of heavy trust-busting artillery, it now develops that its instrumentalities, far from having an effectiveness for those purposes, is an aggregation of smooth-bore hot-air guns, its projectiles the dimensions of a shriveled pea and the consistency of a blue-mass pill. As an irritant and an obstruction to the enterprising and law abiding, it has, however, all the efficiency of a barbed-wire entanglement reinforced by hidden mines and concealed pitfalls."

Mr. Mondell voted for the bill when it was originally in the House. Minority Leader Mann, who opposed the report, said he "thought it would be a very good time for us, with world conditions as they are now, to stop trying to hamper business and to legislate so that we may increase our business and add to prosperity of our land and our people." In opening his remarks, he said he did not believe that any country in the history of the world ever had such an opportunity as this country now has to develop its own domestic commerce and to increase its foreign commerce.

Representative Webb, Democrat, who had charge of the bill, strongly defended it and said, among other things, that "when this bill passes, the laboring men should have a jubilee, because during the long, weary years of Republican administration, they were begging at your doors and praying to you for such legislation, but got a stone." Sitting in the gallery at the time were Samuel Gompers and Frank Morrison, president and secretary, respectively, of the American Federation of Labor.

Representative Floyd, of Arkansas, Democrat, one of the conferees on the bill, [illegible] report.

He began by saying that, contrary to published reports, only one criminal penalty was eliminated, and that was in section 2, inserted by the Senate. The entire section went out in conference, he stated. It corresponded to and was substituted for section 4 in the House bill, which applied not only to patented but unpatented articles and that section was restored without penalty.

The bill as it passed the House, said Mr. Floyd, contained six sections that provided criminal [illegible] namely, sections 2, 3, 4, 8, 9 and 12, the last being commonly referred to as the personal guilt clause of the bill. Sections 2, 4 and 9, the latter pertaining to interlocking directorates of banks, were restored in conference as they passed the lower body, while section 12, now section 14, was left undisturbed.

"The bill as it comes to you today," said Mr. Floyd, "for consideration contains the substantive provisions of every section of the bill as it passed the House, with the exception of section 3, which was stricken out entirely; and it contains every substantive provision that was added by the Senate, with the exception of sections 25 and 26, which were stricken out in conference, and section 2, already referred to, which was also stricken out." He contended, therefore, that the "teeth" had not been taken from the bill.

Penalties Stricken Out

Taking up sections 2, 4 and 7, relating to tying contracts, exclusive contracts and holding companies, respectively, Mr. Floyd said it would be observed that these sections deal with contractual relations in commercial dealings. After the penalties were stricken out, he asserted, the provisions of sections 2 and 4 were modified, because as criminal sections they were drafted with all the particularity of criminal statutes, the intent and purpose being included. But that, it was pointed out, is not the rule applicable to contracts. So, the speaker said, when it was decided that the acts forbidden, instead of being made penal and criminal, should be simply condemned as unlawful, a modification was made in harmony with principles governing the construction and interpretation of contracts. The words "substantial lessening of competition or tend to create a monopoly" originated, it was stated, from a discussion in the opinion of the Supreme Court of the United States in the case of the Addyston Pipe Co. The House provision in regard to interlocking directorates of industrial corporations was retained in the bill by the Senate, Mr. Floyd explained, without the penalty. Under section 4 of the bill reported by the conferees, Mr. Floyd said, any person injured in his business or property by anything declared to be unlawful in any anti-trust law or by this act is entitled to go into any district court without regard to the amount in controversy and recover threefold damages. Further, under section 5, it was stated, any private litigant injured by the unlawful acts of any corporation where the government has proceeded against such corporation and obtained a judgment, either in a court of law or equity, is allowed the use of that judgment or decree to show the unlawful acts of the combination to the full extent that it would be an estoppel between the government and the original offender. This was declared to be a remedy never given to litigants before. It was said the only difference between this and the House provision is that this is made prima facie while the House made it conclusive. Section 16 was described as giving any individual, company or corporation damaged in its property or business by the unlawful operation or actions of any corporation or combination the right to go into court and enjoin the doing of these unlawful practices, and not to wait until the act is done and the business destroyed and then sue for damages. That clause in the provision was said to make it specifically applicable to sections 2, 3, 4, 7 and 8 of the bill.

There are several other remedies in the bill, said Mr. Floyd, who pointed out that under Section 11 the viola-

Business News from the Capital

Switching Absorption and Spotting Tariffs Suspended by Interstate Commerce Commission—Many New Tariffs from Western Lines Expected

tion of Sections 2, 3, 7 and 8 may be enforced by Federal Trade Commission, the Interstate Commerce Commission or by the Federal Reserve Board. Section 14 the personal guilt clause was declared to apply to all of the penal sections of the anti-trust laws and was said to go further than the courts have ever gone in convicting officers, directors of agents for violations of the Sherman law.

Coming to the labor sections Mr. Floyd said that the "enemies of this bill, those who are fighting it, are not fighting it on account of what has been left out of the bill, but they are fighting it on account of what has been left in the bill, notably the labor sections of the bill."

Referring to the Senate amendment that the labor of a human being should not be considered a commodity or article of commerce, Mr. Floyd observed:

"And when since the emancipation of the negroes has labor ever been an article of commerce, except as the great corporations, north, south, east and west, have sought by court proceedings and injunctions to put upon the laboring class of this country a species of constructive slavery almost as galling as was the chattel slavery of the south?"

Proposed Freight Advances

Washington, Oct. 13.—The forerunners to the general advance in commodity rates to be sought by railroads west of the Mississippi river have been filed with the Interstate Commerce Commission. These are tariffs filed by southwestern lines asking for an increase of 10c per ton of 2,000 pounds on coal and coke. The schedules are filed to become effective Dec. 1. It is expected that tariffs in large numbers will begin to pour in upon the commission from the western lines, to become effective on or about Dec. 1, the commission itself having issued a statement making this forecast. The advance coal and coke tariffs were filed by Agent F. A. Leland. One pertains to rates from stations in Arkansas and Oklahoma to points in Arkansas, Louisiana, Mississippi, New Mexico and Texas. The other proposes an advance on coal and coke from Alton, Cairo, East St. Louis and Thebes, Ill.; Hannibal and St. Louis, Mo.; Memphis, Tenn.; Vicksburg, Miss., and other Mississippi river crossings and New Orleans to stations in Texas.

Can't Get Safety Devices

Washington, Oct. 13.—The European war has made it impossible for owners to obtain safety devices for gas cylinders by Dec. 31, 1914, as recently prescribed by the Interstate Commerce Commission in a ruling governing transportation of explosives and other dangerous articles. Because of this the commission has extended the time limit until March 31, 1915, that the devices might be elsewhere.

Spotting Tariffs Are Suspended

Washington, Oct. 13.—Two interesting orders further suspending switching absorption and spotting tariffs, the former from Oct. 30 until April 30, and the latter from Oct. 29 until April 29, were issued last week by the Interstate Commerce Commission.

The switching absorption schedules are those of the Wheeling & Lake Erie railroad, by which that line proposes to absorb switching charges in connection with serving steel plant lines in Cleveland, Newburgh and South Lorain, O. The so-called industrial lines involved include the Cuyahoga valley and the River Terminal, both of Cleveland, the former operated by the Cleveland Furnace Co., and the latter by Corrigan-McKinney & Co.; the Newburgh & South Shore, Cleveland and Newburgh, operated by the American Steel & Wire Co., and the Lake Terminal, South Lorain, operated by the National Tube Co.

When the commission held in the Industrial Railways case that division granted steel plant lines constituted rebates, the Wheeling & Lake Erie, instead of doing away with joint rates and filing spotting tariffs, proposing charges for a service which they had previously paid for, filed switching absorption tariffs. By these tariffs, the Wheeling & Lake Erie would assume the cost of switching on these steel plant lines, instead of throwing the burden upon the latter.

Spotting tariffs filed generally by railroads throughout eastern classification territory propose a charge of 5½c per ton, with a minimum of $2 per car. They were the outgrowth of both the Industrial Railways case decision and hearings in the 5 per cent advance rate case.

The commission has not set a date for hearing the cases connected with the two further suspensions ordered last week.

Rates on Scrap

Washington, Oct. 13.—Authority has been granted by the Interstate Commerce Commission to the Alabama & Great Southern and its interested connections to establish rates on scrap iron, in straight or in mixed carloads, with rails and railroad track material, minimum weight 20 gross tons, from Birmingham, Ala., and group, to Huntington, W. Va., the same as rates concurrently in effect on pig iron from and to the same points. The pig iron rate from Birmingham to Huntington is $3.75 per ton, while heretofore there has been no through rate between those points on scrap.

The Atlantic Coast Line and connections have been authorized by the commission to revise the commodity descriptions covering railroad track material to conform to the descriptions in southern classification and to include nut steel cross tie clamps, track nuts, track bolts and track washers. The application was made in connection with railroad material from eastern and Virginia cities and interior eastern points to southern territory.

The commission has authorized the Pennsylvania and Lehigh Valley railroads to establish a rate of 85c per ton of 2,000 pounds or 2,240 pounds on iron and steel articles from Philadelphia to South Bethlehem, Pa.

Steel in Transit

Washington, Oct. 13.—The Interstate Commerce Commission has further suspended from Oct. 17 until April 17 new rules governing the stopping in transit of iron and steel articles for fabrication and re-working at points on the Santa Fe railroad when the finished product is to be re-shipped to points in Arkansas, Louisiana, Texas, Oklahoma or the Republic of Mexico.

The Pittsburgh Coal Co. has declared the usual quarterly dividend of 1¼ per cent on its preferred stock, payable Oct. 26.

How to Get Latin American Trade

Most Important Problem is That of Credits, Says Director General Barrett—

Encouraging Progress Has Been Made by the United States

Pittsburgh, Oct. 12.—"American Products for Latin American Consumers" was the keynote sounded by John Barrett, director general of the Pan-American Union, this noon in an address following a luncheon given by the Pittsburgh Foreign Trades Commission at the Fort Pitt hotel. If domestic manufacturers are willing to extend customary credits to Central and South America, they should be able to build up a vast trade, Mr. Barrett told representatives of nearly all the important manufacturing interests in this district. In return, it was explained, the United States will have to find a market for the products of the Latin American countries which were going to Europe before the outbreak of the war.

After describing "Our Pan-American Opportunity and Responsibility", Mr. Barrett told how domestic manufacturers may build up a remunerative trade with Latin American states. He said that the United States should be able to secure much of the trade previously enjoyed by nations participating in the war sweeping over Europe, but he pointed out that those nations already had taken steps to hold their grip on South American commerce.

The most important problem of the hour, Mr. Barrett asserted, is that of credits. Latin America was just beginning to emerge from the bad effects of a period of abnormal expansion and prosperity, he said, when the European war literally threw most countries in Central and South America flat upon their backs. Efforts of the National City Bank of New York to establish sound credit in South America were commended. "If we had established banks in Latin America three years ago, as I suggested to leading financiers in this country, we could obtain practically all the trade now enjoyed by foreign nations in Central and South America," he said.

"For the year ending just before the outbreak of hostilities in Europe, Latin America bought and sold nearly $3,000,000,000 worth of products," Mr. Barrett explained. "Of this, nearly $2,000,000,000 was with Europe, and chiefly with belligerent nations. It looks, therefore, as if the United States should be able to build up a vast amount of new trade. For the year just mentioned, it will encourage you to know, the United States bought and sold more to Latin America than any other one country in the world."

J. Rogers Flannery, chairman of the commission, and president of the Flannery Bolt Co., in introducing Mr. Barrett, outlined the work of the foreign trades organization. He briefly described the nature of comprehensive reports showing commercial and financial conditions in South America and explained that information would be offered gratis to manufacturers in this district. Col. H. P. Bope, vice president and general manager of sales of the Carnegie Steel Co., is vice president of the commission; several steel company officials served on the committee in charge of the luncheon.

Hints to American Mills

New York, Oct. 13.—Thomas L. Barks, partner of the Trough Bar Glazing Co., 38 Victoria street, Westminster, S. W. London, now is in the United States, endeavoring to make arrangements with steel makers to roll a special trough bar section for roofing construction, which his company has been marketing for some time. The company formerly had these bars rolled by mills at Liege, Belgium, and the war conditions have broken down that source of supply. About 400 to 500 tons of these bars have been distributed by the company annually. Mr. Barks' temporary address in this country is apartment No. 62, at 195 Claremont avenue, New York City.

"I believe American steel manufacturers will be able to obtain a large volume of trade from English buyers which has been going outside of our country, if they will be willing to meet the needs and ideas of the trade, especially of the smaller class," said Mr. Barks to THE IRON TRADE REVIEW. "To realize this business to the fullest extent, however, it will be necessary for them to manufacture for us such forms of iron and steel material as we know from experience are necessary in our business and as we have been receiving from Germany and Belgium; also, if the American steel manufacturers will put themselves in a position to furnish to the smaller English buyers of steel lots of such size as we are able to handle, and as we have been accustomed readily to obtain from Germany and Belgium,—and not try to make a tonnage proposition out of it—it will help them greatly to capture most of the business that formerly has been going to these two neighboring countries."

Decline in Foreign Commerce

The statistics of those iron and steel imports and exports which are reported on a tonnage basis show the great loss due to the war. The statistics for August are now available and show that imports for the first month after the war began were 28,571 tons, compared with 18,740 tons in August, 1913, and 24,956 tons in July, 1914. The exports for August were 86,596 tons, compared with 209,854 tons in August of last year and 114,787 tons in July of this year.

IRON AND STEEL IMPORTS, GROSS TONS.

	August,		Eight months ending August,	
	1914.	1913.	1914.	1913.
Scrap	3,469	1,686	22,351	36,574
Pig iron	13,878	11,069	87,741	109,193
Ingots, bloom, billets of steel, n. e. s.	3,646	1,561	29,632	15,491
Wire rods	171	1,112	5,491	11,706
Rails	2,070	52	11,340	3,562
Bar iron	1,615	1,818	13,433	20,961
Structural	1,909	1,104	8,103	9,015
Sheets & plates	271	152	3,121	2,290
Tin & terne plate	1,542	186	14,612	15,422
Total	28,571	18,740	195,824	224,214

Of the imports of pig iron, 8,491 tons came from the United Kingdom in August, 1913, and 5,262 tons last August, but in the latter month, the imports from Canada amounted to 7,462 tons, compared with only 509

IRON AND STEEL EXPORTS, GROSS TONS.

	August,		Eight months ending August,	
	1914.	1913.	1914.	1913.
Scrap	1,460	5,351	28,953	64,425
Pig iron	2,918	19,996	83,299	185,020
Billets, ingots and blooms of steel	2,714	4,208	32,613	81,904
Wire rods	855	1,280	39,236	48,479
Steel rails	10,030	43,818	129,265	331,676
Steel bars	5,270	14,924	73,014	150,313
Iron bars	594	1,647	3,357	11,575
Structurals	15,851	33,154	134,167	281,668
Hoop, band and scroll	413	1,231	6,188	12,273
Sheets and plates	16,881	39,123	200,785	335,873
Tin and terne plate	5,296	3,864	40,058	44,382
Barbed wire	4,752	7,099	47,646	51,708
All oth. wire	3,012	6,257	49,326	76,903
Cut nails	132	308	2,944	2,493
Wire nails	1,133	4,196	19,348	32,243
All oth. nails, includ. tacks	152	324	1,757	2,793
Pipes and fittings	13,241	20,071	135,058	210,661
Railr'd spikes	796	696	5,500	8,356
Bolts, nuts, rivets, washers	693	1,808	10,709	15,296
Horse shoes	40	82	740	852
Cast radiators	363	417	2,453	5,470
Total	86,596	209,854	1,046,416	1,954,363

tons in August, 1913. Iron ore came from the following countries:

Iron ore:	Tons, 1913.	Tons. 1914.
Spain	.....	14,869
Sweden	34,419	18,248
Canada	26,828	8,894
Newfoundland and Labrador.	24,420	6,500
Cuba	116,520	77,980
Other countries	10,952	9,202
Total	213,139	135,693

Exports of Lead

Washington, Oct. 13.—The Bureau of Foreign and Domestic Commerce, Department of Commerce, today issued a statement showing that the total exports of domestic lead in ore during the six months from March to August, 1914, inclusive, aggregated 72,750,000 pounds, valued at $2,810,000, this being the first record of such exports. The bulletin states that the new development in the export trade of domestic lead shipped to foreign countries prompted special reports from collectors in view of the possible importance of this new trade. For many years domestic lead had been a negligible quantity in export trade, practically all the exports of lead having been re-shipments of Mexican lead in bullion and ore, with smaller amounts from Germany, England, Canada, South America and German Africa. Exports of domestic lead, the bulletin says, first became noticeable in March of the current year.

Usually the imports of lead in ore and base bullion from Mexico have been considerable, having reached the high record total of 213,500,000 pounds in 1909, and being substantially maintained at a level above 130,000,000 pounds annually until June 30, 1913. The fiscal year which ended with June last, however, showed a drop to 44,500,000 pounds and foreign exports correspondingly decreased, with a total of 47,500,000 pounds, compared with 114,000,000 in 1913, and 196,000,000 in 1911, while during August no foreign-produced lead left the country. Of the 40,000,000 pounds of domestic lead exported in the four months which ended with June last, 13,000,000 pounds were shipped to England, 10,000,000 to Germany, 9,500,000 to the Netherlands, 4,250,000 to Belgium, 1,000,000 to Scotland, and smaller amounts to Russia and other countries.

The greatly diminished supply of Mexican lead in the domestic markets is illustrated by the fact that the total imports of lead in ore and base bullion received from Mexico dropped from 120,000,000 pounds in the eight months which ended with August, 1912, to 83,000,000 in the corresponding period of last year and only 21,000,000 in the corresponding period of the current year.

Armor Plate

Prices on New Dreadnoughts Lower Than on the Arizona

Washington, Oct. 13.—Submitting a figure of $435 per ton, the Bethlehem Steel Co. was the lowest bidder on Class A-1 armor for the three dreadnoughts to be built for the government. The Midvale Steel Co. was the lowest bidder on two other grades, Class A-2 and Class C, at $486 and $376, respectively, while it submitted the same figure, $466, as the Bethlehem company on Class B. Opening of the bids, which took place on Wednesday of last week, was attended in person by Secretary Daniels of the Navy Department.

The bids in detail follow:

	Classes			
	A-1	A-2	B	C
Bethl'm Steel Co..	*$435	$499	$466	$395
Midvale Steel Co..	436	*486	*466	*376
Carnegie Steel Co.	440	504	471	548
Carbon Steel Co...	...	...	...	431.20

*Lowest bids, Bethlehem and Midvale submitting same figures on Class B.

In a statement issued after they were opened the secretary compared the bids of last week with those originally submitted on the Arizona, which were rejected, and those accepted at the reopening, all of the latter, save on Class C, having been made by the Midvale company. This comparison follows:

	Classes			
	A-1	A-2	B	C
Arizona bids.....	$454	$518	$496	$586
	440	504	471	448
Last week's bids..	435	486	466	376

The three battleships will require 22,122 tons of Class A-1 armor, 4½ to 13½ inches thick; 1,203 tons of Class A-2; 870 tons of Class B, special treatment plates, and 189 tons of Class C, bolts and nuts. The Midvale company put in bids for only two battleships, while the Bethlehem and Carnegie companies submitted figures for either two or three.

Secretary Daniels immediately remarked that the lowest figures were not much below those submitted by the Midvale company in its second set of bids on the Arizona last October. The secretary did not appear to be entirely pleased with the reductions, although he took occasion to issue a statement denoting some satisfaction. It was pointed out by him that "the savings thereby effected through the difference between today's bids and the awards for armor on the Arizona reach the sum of $150,222."

"But the result achieved by the insistence of the secretary of navy," the statement continues, "that contracts for armor would be awarded only in the open field of competition is more evident through a comparison of today's figures with those first submitted for armor for the Arizona. Were the government obliged to purchase the armor prescribed in the specifications opened today at the prices submitted, in the first estimates on the Arizona, it would cost $517.22 more."

Report Shows Decrease

Further emphasizing the unsatisfactory period through which the iron and steel industry has been passing for the past year and a half, the report of the Pittsburgh Steel Co., for the fiscal year ended June 30, last, shows a falling off in net earnings of $777,119 to $416,551. While the volume of the company's output shows no great change compared with the previous year, the margin of profit was much lower, owing to the low level of prices. Referring to this the company states the prices of all products it manufactures, namely: Pig iron, steel billets, bars, hoops, bands, skelp, cotton ties, wire rods, smooth wires, wire nails, barbed wire, fence staples, fabricated fencing, etc., reached an exceedingly low level, probably the lowest in 15 years. Shipments on the other hand, were 292,554 tons, against 306,377 tons the previous year. The income account compares as follows:

		Decrease.
Sales	$10,824,763	$830,125
In. fin. goods end period	1,310,252	*166,320
	$12,135,015	$843,805
Inv. fin. goods, begin. period	1,143,932	134,046
	$10,991,083	$529,759
Mat. used and op. cost.	9,277,785	*74,925
	$ 1,713,298	$613,784
Selling and gen. exp....	1,168,299	18,040
	$ 544,999	$595,744
Int. and misc. income..	73,271	11,650
	$ 618,270	$607,394
Interest charges	201,719	169,725
Net earnings	$ 416,551	$777,119

*Increase.

The report advises that since the closing of the fiscal year, ended June 30, last, a large tonnage of iron ore has been shipped directly from the company's mines, recently acquired on the Cuyuna range to the company's blast furnaces at the Monessen, Pa., works. It states the quality of the ore has proven highly satisfactory and the using of its own raw material should be reflected in the next annual statement. Commenting on the general situation, the report, which is signed by President Wallace H. Rowe, says:

"In view of the European war, and the uncertainty as to the extent to which it would affect your company's business, your directors, at a meeting held Aug. 12, 1914, decided that it was prudent to conserve the company's cash resources, and therefore, by unanimous vote, decided to defer the payment of the dividend on the preferred stock, usually paid on Sept. 1.

TIPS FOR NEW BUSINESS

Equipment needs of the Iron and Steel works, Machine shops, Foundries and other Metal Working plants

While demand from domestic buyers continues very poor, there has been considerable activity in the New York machinery market during the week as a result of large orders placed for shipment abroad. Prominent among such business, are orders placed with a good many lathe manufacturers for 14 to 16-inch swing turret lathes and engine lathes. These are to be shipped as quickly as possible to England, where they will be used in making shrapnel cases. It appears that a large number of lathe manufacturers, in Cincinnati particularly, shared in the allotment of this business. A large quantity of machinery, it is understood, is being placed by the Bethlehem Steel Co., although details of this business are not available. It is understood some of the machinery will be installed at South Bethlehem, while a large part will be shipped to France. A leading event of the week was the booking by a New York house of the machinery for an arsenal for the Greek government. Some good shipments of lathes and other standard machine tools were made to Spain and it is learned that considerable machinery was sent to Germany by way of Rotterdam. A better demand is reported from Italy on all kinds of machinery and the leading houses here now manifest less hesitation in making shipments to that country. As far as the domestic market is concerned, no new lists of importance have been issued and the business which has been placed consisted mostly of small lots. There was a good scattering demand for second-hand machinery. An improvement in demand is expected to develop shortly as the result of plant extensions which a large number of eastern manufacturers are getting under way.

At Pittsburgh, scattering inquiries for machine tool and heavy rolling mill equipment continue to come out, but new orders are comparatively light and far from normal in volume. From Youngstown comes a report that a bolt maker at Cuyahoga Falls, O., has completed plans for a new puddling and rolling mill, in which furnace and mill builders at this center are interested. The Logan County Light & Power Co., Logan, W. Va., is negotiating for two 2,500-kilowatt turbines, pumps, condensors, etc., and the Big Eagle Mining Co., Ottowa, W. Va., is in the market for hoisting equipment. Considerable power and heating equipment is involved in new high school buildings under active consideration in this city, and bids soon will be asked for power, electrical, ventilating, heating and elevator equipment for the new William Penn hotel.

Sellers of machine tools in Chicago find no change in conditions. With railroads entirely out of the market and other users of equipment curtailing their expenditures as far as possible, inquiries are few and sales are fewer. More interest is being manifested in second-hand machinery than in the new variety, but even this fails to move with any activity. The Pennsylvania Railroad Co. put out an inquiry several months ago for equipment to go into its new shops at Indiana Harbor, but nothing has been done since these bids were received and the matter is still quiescent. This list totaled about $15,000. Such sales as are being made at present are like those which have characterized the entire summer and fall, single tools.

In Cincinnati it develops that the principal orders for machine tools taken recently include an aggregate of about 145 engine lathes, for shipment to Russia, England, Holland and Italy. Some of these have been divided between the Cincinnati Iron & Steel Co., the R. K. LeBlond Machine Tool Co., the Graves-Klusman Tool Co., the Lodge & Shipley Machine Tool Co., the American Tool Works Co. and the Champion Tool Works Co. One large machine tool maker here states that in his opinion several small orders for domestic lathes are included in this aggregate of 145, which was supposed to have been for foreign shipment entirely. The Greaves-Klusman Tool Co. and the R. K. LeBlond Tool Co., which have been running on part time only, have recalled all of their workmen and are now running on full time with sufficient orders to carry them through the next few months. There is a better feeling in the machine tool market, but conditions are still very slow and below the standard of last year. Small electrical equipment is in fair demand, but orders for special machinery have fallen off since last summer.

EASTERN STATES

PORTLAND, ME.—Date asked for bids for the construction of a bridge between Portland and South Portland (Oct. 22) has been extended until noon, Nov. 2.

SKOWHEGAN, ME.—Maine Spinning Co. is contemplating enlarging its plant about one-sixth its present capacity.

MANCHESTER, N. H.—McLane & Taylor will build a three-story, 35 x 78-foot brick building for light manufacture in Willow street.

LYNDONVILLE, VT.—A. N. Wetherbee has purchased property here and will begin building his novelty wood working plant at once.

MONTGOMERY VILLAGE, VT.—M. J. Blair, of North Troy, will remove machinery from the veneer mill in this village to North Troy, where he will enlarge his plant.

BOSTON.—American Rotary Pump Co. has been incorporated; $50,000; by George A. Whitmore, Charles E. Maxwell, Reinold Berrenberg.

BOSTON.—Perfection Jar Opener Co. has been incorporated; $25,000; by Cutris H. Waterman, Fred W. Dickerman, Aileen J. Burke.

BOSTON.—W. H. Grove will build a five-story, 50 x 225-foot brick factory building in East Derby street, Salem, Mass.

BOSTON.—Boston Marine Hardware Co. has been incorporated; $25,000; by Edward D. Kimball, Wesley P. Hume, Harry L. Linnell.

BOSTON. — Learnard-Tompkins Electric Co. has been incorporated; $50,000; by Arthur. W. Learnard, Clarence G. Tompkins, William B. Phipps.

An installation of Ayer & Lord Interior Wood Blocks in a large automobile concern. Name of shop upon application.

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Ayer & Lord Interior Wood Blocks will prove one of the greatest investments that any factory or shop-owner could possibly make.

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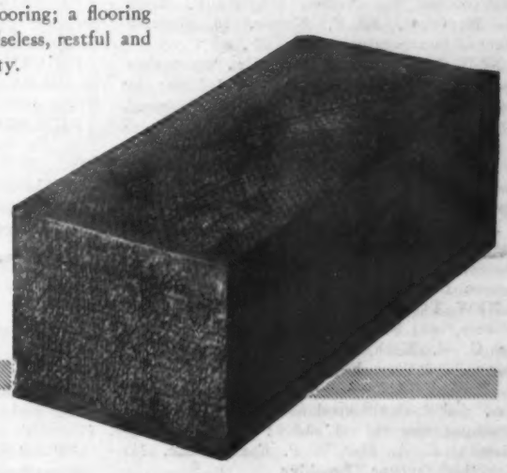

Ayer & Lord Tie Company

General Office: Railway Exchange, Chicago

CLEVELAND, O.—801 Swetland Bldg. ST. LOUIS, MO.—554 Pierce Bldg.
KANSAS CITY, MO.—1117 Rialto Bldg. MEMPHIS, TENN.—1402 Exchange Bldg.
PHILADELPHIA, PA.—319 Perry Bldg.

CHICOPEE, MASS. — D. J. Curtis Brake Co. has been incorporated; $20,000; by Daniel J. Curtis, Mary H. Hayes, Gertrude R. Ryan, Anna L. Curtis, Daniel J. Curtis Jr.

SALEM, MASS.—Gannon Bros. will erect a three-story, mill construction factory on Putman street, Gallows Hill; work will begin shortly.

WESTFIELD, MASS. — Johnson & Hibbard's factory suffered about $5,000 by fire; company makes trucks and window frames.

MERIDEN, CONN.—Ayer Mfg. Co., maker of composition and buffing wheels, is making plans for the enlargement of its plant, which will double its capacity.

WILLIAMSVILLE, CONN.—Killingly Mfg. Co., a subsidiary of the Goodyear Tire & Rubber Co., will erect a factory for manufacturing heavy cotton duck for automobile tires.

ALBANY, N. Y.—Mt. Whitney Power & Electric Corporation has been chartered at $4,800,000, to take over a California corporation of the same name; will begin business with $1,712,500; T. T. Trapnell, R. D. Hanna, H. Hammond, 903 Park avenue, New York, incorporators.

BROOKLYN.—Max Auerbach's knitting mill was damaged by fire; loss about $8,000.

BROOKLYN.—Fire badly damaged J. H. Werbelovsky's Sons' three-story plate glass factory, 122 Leonart street.

BROOKLYN, N. Y.—Herman Kramer, 18 Bushwick avenue, is having plans drawn for an addition to his blacksmith and wagon shop.

BROOKLYN, N. Y.—Architect Jacob Liebroth, 186 Remsen street, drawing plans for three-story 42 x 95-foot factory building, to be erected for Samuel Braber.

HEMPSTEAD, N. Y.—Topford Detachable Limousine Co. has been incorporated; $50,000; by Frank C. Cadden, William Hutchinson, John A. McAvoy, Hempstead.

LESTERSHIRE, N. Y.—Endicott, Johnson & Co. have acquired property on Avenue C, and will erect an addition which will double the capacity of their shoe factory.

NEW YORK.—Partola Mfg. Co. has increased its capital from $125,000 to $500,000.

NEW YORK.—Houpert Machine Co. has increased its capital from $25,000 to $100,000.

NEW YORK.—Susquehanna Silk Mills has increased their capital from $50,000 to $3,500,000.

NEW YORK.—Peerless Automatic Machine Co. has been incorporated; $30,000; by F. M. Hill, P. E. Igel, J. S. Brown, 54 St. Nicholas street.

NEW YORK.—St. Clair Construction Co. has been incorporated; $500,000; by H. H. Esselstyn, A. Dow, A. Jaretski, 49 Wall street.

NEW YORK.—Invader Textile Corporation has received its charter; $75,000; E. Boyd, M. Nydegger, A. F. Kneale, 10 Sherman avenue, incorporators.

NEW YORK.—Spar East Co., automobile supplies, has been incorporated; $60,000; by W. H. Natter, R. E. Hallock, A. H. Seymour, 27 Pine street.

NEW YORK.—Holt Welles Co., carburetors, automobile supplies, has been incorporated; $50,000; by P. Welles, E. H. Stickels, C. Holt, 14 West Fifty-fifth street.

NEW YORK.—Coin Devise & Signal Co. has been incorporated; $70,000; by C. M. Mazza, H. A. Drew, E. C. Hobcraft, 1375 Lyman place.

NEW YORK.—Walter H. Bowes Co., machinery, etc., has been incorporated; $100,000; by G. F. Kuch, E. H. Hotchkiss, W. H. Bowes, 207 West Fifty-fifth street.

NEW YORK.—American Hotel Machinery Co., dish-washing machines, tables, etc., has been incorporated; $250,000; by A. R. Appleman, E. A. Dorsch, P. Campaigniac, 351 Tompkins avenue, Brooklyn.

ROCHESTER.—Rochester Paper Bottle Co. has been incorporated; $50,000; by J. Hainovici, E. B. Gibson, R. B. Culver.

ROCHESTER, N. Y. — Marschner Bros. Co., general contractor, has been incorporated; $60,000; by W. H. Maclean, W. C. and E. E. Marchner.

SCARBOROUGH-ON-HUDSON, N. Y.—Continental Process Corporation, metals, compounds, waste products, chemical, scientific apparatus, has received its charter; $2,000,000; H. Carter, W. Lyttle, J. C. Barr, 179 Marcy avenue, Brooklyn; incorporators.

SHEEPSHEAD BAY.—Knauer & Jockers Wagon Works has been incorporated; $5,000; by L. and H. E. Jockers, C. Knauer, 2,245 Twelfth street, Sheepshead Bay.

SYRACUSE.—Everstrong Knitting Co. has been incorporated; $10,000; by C. W. Fesenger, F. H. Shepard, S. L. Hartman, Lyons, N. Y.

TROY, N. Y.—Troy & West Troy Bridge Co. has increased its capital from $150,000 to $300,000.

WATERTOWN, N. Y. — Eager Electric Co. has increased its capital from $20,000 to $40,000.

WATERTOWN, N. Y.—Remington Paper & Power Co. has been incorporated; $1,575,000; by M. S. Wilder, N. R. Casbell, L. Bittner, 534 Eighth street, Brooklyn.

ALLENTOWN, PA.—R. H. Garnet, 527 North Sixth street, has let the contract for a one-story, 32 x 100-foot factory building.

ALLENTOWN, PA.—Daily Steel Products Co. has purchased the old Cole factory at East Main and Hosmer streets and plan to move into these larger quarters about Nov. 1.

BRADFORD, PA.—Fire did about $20,000 damage to the Bradford Furniture Co.'s factory; insurance $15,000.

BUTLER, PA.—At Parker, a committee of citizens has purchased an abandoned glass bottle factory, formerly occupied by the Wightman Glass Co.; the plant will be re-equipped and put in operation.

ELWOOD CITY, PA.—Thomas A. Gilkey, county engineer will receive bids until Oct. 28, for a steel bridge 645 feet long with a concrete arch of 35-foot span at each end, at a cost of about $100,000.

ERIE, PA.—Mayer-Blair Construction Co. has been incorporated; $10,000; by Joseph G. Mayer, Neal Blair, Ralph L. Lee.

ERIE, PA.—Pa-Leo Wertheimer, Buffalo, N. Y., has purchased property and will erect a $60,000, fireproof photo play theater.

HARRISBURG, PA.—State board of health approved plans for municipal water plant at Sykesville.

MANOR, PA.—West Penn Chemical Co. plans erection of two-story plant for manufacture of brick; capacity will be increased.

PHILADELPHIA.—General Mfg. Co. has prepared plans for addition to its plant at Swanson street and Snyder avenue.

PHILADELPHIA.—Barcley White Co. will soon break ground for the Martin & Wm. H. Nixon Co.'s $30,000 addition to its plant.

PHILADELPHIA. — Simplex Vacuum Mfg. Co. has been incorporated; $50,000; by Frank F. Bell, Bristol, Pa., et al.

PHILADELPHIA. — Philadelphia Paper Mfg. Co. plans to erect a $20,000, one-story, brick boiler house at Nixon and Fountain streets.

PHILADELPHIA. — Linde Air Products Co., New York, has purchased property at Eighteenth and Cambria streets, having a 135-foot frontage on Cambria street, and will erect a plant.

PHILADELPHIA. — M. Patterson, 2203 Pearl street, has let the contract for a two-story and basement, 26 x 100-foot factory at Fiftyninth street and Woodland avenue.

PHILADELPHIA.—A. Schoenhut Co., Boston avenue, near Adams street, has let contract for construction of boiler house, engine room, pump house, coal vaults and garage, all to be located in one building, 54 x 125 feet.

PHILADELPHIA, PA. — Specialty Engine Co., Emerald and Cornwall streets, is having plans prepared for a two-story, 50 x 100-foot, brick and concrete factory building to be erected at Trenton and Allegheny avenues.

PITTSBURGH.—Liberty Baking Co. will build seven story addition to its building; C. D. Cooley, Century building, has plans.

PITTSBURGH. — Hachmeister-Lind Chemical Co., Forbes street, plans four-story brick, steel and concrete storage building, 96 x 100 feet.

PITTSBURGH. — Horseshoe Clamp Mfg. Co. organized by Charles C. Colteryahn, Thomas D. Stewart, Harry A. Cannon and others to manufacture horseshoe clamps.

PITTSBURGH.—New plant of the Gem Mfg. Co., North Side, is now under roof; company will move before end of year; some new equipment contemplated.

PITTSBURGH. — Pittsburgh Manganese Co., W. H. Schoen, Farmers' Bank building, president, contemplates sinking second shaft at ore mines at Elkton, Rockingham county, Va., which will involve additional mining machinery.

PITTSBURGH.—Backer Folding Table Co. has been incorporated in West Virginia by Charles H. Fritch, Arthur J. Backer and Frederick C. Hanford all of this city, to manufacture furniture and patented specialties; capital $25,000.

PITTSBURGH. — Board of Education awarded Dawson Construction Co., May building, contract for a $219,624 2-story, brick and stone school building at Bedford avenue and Erwin street; Carlton Strong, architect Union Bank building, is in charge.

PITTSBURGH.—Central Ohio Gas & Electric Co. was incorporated Sept. 15, at Dover, Del., capital $25,000, to acquire oil and gas lines in western Pennsylvania and Ohio, to operate gas works, to generate and purify gas, to lay pipe lines, to erect dams, ducts, etc. M. M. Hirons and Walter P. Carrow, of Dover, are named in the charter.

SOUTH BETHLEHEM, PA. — Bethlehem Steel Co. has put out inquiries for 40 lathes, 20-inch swing, of special design; these are to be used for a purpose not announced.

UNIONTOWN, PA. — Consolidated Coke Co. has been incorporated; $5,000; by H. L. Robinson, J. C. Patterson, Connellsville.

VALENCIA, Pa.—Sewage treatment plant will be installed by Kingsley House Association.

WAYNESBORO, PA.—Waynesboro Power Lawn Mower Co. has been incorporated; $5,000; by W. H. Gelbach, S. E. Beeler, W. R. Snively, D. N. Benedict, L. G. Gilbert, P. D. Hoover, Daniel Rinehart.

WILKESBARRE, PA.—Lehigh & Wilkesbarre Coal Co. is having plans drawn by Sturdevant & Poggi, architects, coal exchange building, for large colliery shops; plans will be completed about Jan. 1, and it is expected the construction of the shop will entail an expenditure of $500,000.

YORK, PA.—Herbert R. Averill, Ernest E. Gillard, B. Franklin Posey and others have organized company to manufacture automobiles to sell for $700; will erect plant.

CAMDEN, N. J.—W. D. Haines Co., agricultural implements, has been incorporated; $50,000; by Wm. D. Haines, Frederick R. Haines, Haddonfield, N. J.; Chester N. Steelman.

EAST ORANGE, N. J.—Nitram Mfg. Co., net goods, has been incorporated; $100,000; by Harry L. Picking, Charles Greger, Frank E. Ruggles.

HIGH BRIDGE, N. J.—The Taylor-Wharton Iron & Steel Co. has let contracts for 15 electric traveling cranes and 20 wall cranes, for its new Easton, Pa., plant, to the Cleve-

land Crane & Engineering Co., Cleveland; orders for the remainder of the equipment will be placed later.

JERSEY CITY, N. J.—Board of education is preparing a list of specifications for machine tools to be installed in the Jersey City industrial high school.

JERSEY CITY, N. J.—Anchor Castors Corporation, manufacturer, has received its charter; $300,000; Harris B. Burrows, East Orange; Timothy Gorman, Charles S. Baeder, New York, incorporators.

NEWARK, N. J. — C. E. Burtis, Inc., construction, has been incorporated; $25,000; by William J. Nurlough, Newark; Charles E. Burtis, William L. Burlins, Westfield, N. J.

NEWARK, N. J.—P. Lowentraut Mfg. Co., mechanical devices, has been incorporated; $125,000; by Anna Lowentraut, Frederick J. Greenburg, Theodore J. Woodring, Westfield.

NEWARK, N. J. — Interlocked Metallic Hose Co. has been incorporated; $20,000; by Walter E. Phillips, William F. Augis, Edward F. Rastner.

WILMINGTON, DEL.—Hutting Mfg. Co. has been incorporated to manufacture lumber, window sashes and doors and to operate steamboats, barges, etc., $6,000,000; by George W. Dillman, L. F. Lefferts, M. L. Horty.

CENTRAL STATES

AKRON, O.—Flanner Water Tube Boiler Co., manufacturer, has been incorporated; $40,000; by G. W. Crouse Jr., J. K. Williams, B. R. Barder, W. W. McIntosh, D. D. Flanner.

CAMDEN, O.—Plans are being prepared by the Reliance Engineering Co. for a municipal light and water works plant to cost about $35,000; the project is to be voted upon Nov. 3.

CARROLLTON, O.—Albright China Co. has been incorporated; $100,000; by A. E. Albright, M. F. Albright, Ralph G. Wright, Ethel Wright, H. J. Albright.

CINCINNATI.—The D. T. Williams Valve Co. is contemplating enlarging its plant; an effort will be made to have this work begun early in 1915; no details have been decided upon.

CLEVELAND, O.—Willard Storage Battery Co. has a permit for a $20,000 factory to be erected at 281 East 131st street; foundation has been laid.

CLEVELAND.—White Co., manufacturer of automobiles, has a permit to erect a brick storage building at its plant, St. Clair avenue and East Seventy-sixth street; cost about $30,000.

CLEVELAND.—S. H. Weis, architect, has completed plans for a group of four apartment houses, which soon will be erected on Stearns road, near Rockefeller boulevard and University circle; they will be brick, about 50 x 80 feet, three-stories; cost will aggregate about $160,000; buildings will be erected by and for Morris & Cornsweet, contractors.

COLUMBUS, O.—State supreme court has authorized Wellsville to proceed with the construction of a municipal lighting plant; $60,000 bonds were issued for this plant.

COLUMBUS, O.—Universal Tractor Mfg. Co. has been incorporated; $100,000; by H. C. Phelps, T. C. Pickard, T. B. Funk, G. R. Hedges, F. H. Raymond.

LOWELLVILLE, O.—Mechan Boiler & Construction Co. has increased its capital from $25,000 to $50,000.

MARION, O.—Serpentine Heater Mfg. Co. has been incorporated; $25,000; by J. Leo Shaw, J. B. Kring, F. E. Peters, C. A. Keune, K. H. Marshall.

MIDDLETOWN, O.—Plans are being prepared for a new water works system to cost $150,000; new equipment will be required throughout.

MIDDLETOWN, O. — Commissioners are planning for the construction of a bridge at Woodsdale and will award the contract late this fall so that the work can begin early in the spring.

PAINESVILLE, O. — W. Albert Davis, county auditor, will open bids Nov. 2 for a steel bridge over the east branch of the Chagrin river, in Kirkland township; certified check, 10 per cent required.

STEUBENVILLE, O.—It is reported that a glass plant will be erected at New Cumberland, O., and that a former superintendent of the Gill factory at Toronto, will be manager.

TOLEDO, O.—Willys-Overland Co. has increased its capital $5,000,000 for building extensions.

TOLEDO, O.—Buckeye Clay Pot Co. is erecting a two-story, 120 x 135-foot addition to its plant; cost about $15,000.

TOLEDO, O.—Toledo Auto Tool Co. has been incorporated; $30,000; by John C. Jones, R. E. Calkins, M. D. Merrick, Frank P. Close, A. A. Allen.

TOLEDO, O.—Acme Level Co., steel levels and squares, has been incorporated; $15,000; by B. F. Culbertson, A. W. Hight, Bernice Strahley, Earl Severcool, E. F. Abbey.

TOLEDO, O.—Imperial Improvement Co., road making machinery, has been incorporated; $100,000; by C. H. Oliver, R. D. Logan, J. A. Mosier, C. R. Menely, E. V. Anspach.

WARREN, O.—Council and state department have agreed that the bridge to be erected on West Summit street shall be of the girder type; estimated cost $35,000.

WILMINGTON, O.—Champion Bridge Co. has been incorporated; $100,000; by A. C. Briggs, E. C. Briggs, A. I. Bailey, J. R. Clevenger, R. L. Owens.

XENIA, O.—The city is considering building a water works plant which will cost about $70,000; plans are being prepared by Pollard & Elms, engineers, of Cincinnati.

YOUNGSTOWN, O.—Republic Iron & Steel Co. has shut down No. 3 furnace and $10,000 will be spent for relining it.

YOUNGSTOWN, O.—General Fireproofing Co. has begun work on a two-story, 50 x 100-foot addition to its plant at Crab Creek.

ZANESVILLE, O.—City council is considering the erection of a municipal light plant.

CHARLESTOWN, W. VA.—Charlestown Veneer Works has been incorporated; $15,000; by John H. McGowan, Edward J. Hurley, James P. Quigley, Salamanaca, N. Y.; William D. Pemberton, Killbuck, N. Y.

CHARLESTOWN, W. VA.—Becker Steel Co., a German concern, has purchased the old Baldwin Steel Works, and will enlarge the capacity immediately for the manufacture of tool steel; company will increase its capital from $50,000 to $250,000.

FAIRMONT, W. VA.—Wetzel Coal & Coke Co., capital $2,000,000, incorporated by J. V. Thompson, Robert Powell, Charles H. Gorley, Uniontown, Pa.

GRAFTON, W. VA.—Hefner & Maysilles, founders and machinist, are interested in complete iron and brass foundry equipment, including tables, saws, shapers, lathes, drills, presses, etc.

NEW CUMBERLAND, W. VA. — New Cumberland Glass Co., glass chimneys, has been incorporated; $25,000; by L. G. Evans, G. W. McNeil, G. M. Burford, J. E. Brandon Jr., G. L. Bambrick.

OAK HILL, W. VA.—Wilt Bolt Nut-Lock Mfg. Co. has been incorporated; $5,000; by George M. Teel, George W. Sturms, Fayettville, W. Va.; S. E. Duncan, S. W. Wilt, H. A. Duncan.

WHEELING, W. VA. — West Virginia Electric Co. expects to apply for a charter for constructing an electric line into the territory covered by the Little Kanawha.

WHEELING, W. VA.—United States Engineers' office, this city, asking bids until Oct. 26 on two 60 horsepower water turbines and two 250 cubic feet air compressors for Dam 28 on Ohio river.

BUNTYN, KY.—Southern Railroad, with general offices in Washington, D. C., has let contracts for buildings, roundhouse, shops and a pumphouse to be erected here, and will later start construction on a coal handling plant, boiler shops, etc.; machinery will soon be purchased.

Equipment News in Tabloid

Good news, like other good things, generally comes in small parcels. The quantity is eliminated, but the quality remains. So it is with the following information. This includes the best items of the week. No matter how busy the reader may be, he will find something of value here. For instance—

Bethlehem Steel Co., South Bethlehem, Pa., has put out inquiries for 40 lathes, 20-inch swing, of special design; these are to be used for a purpose not announced.

M. J. Morehouse, 343 South Dearborn street, Chicago, is preparing plans for a power plant to develop 7,000 horsepower, for the Kellogg Corn Flakes Co., Battle Creek, Mich. It will include several buildings of reinforced concrete construction to house the latest type of equipment. Total cost is estimated at $250,000.

Minneapolis, W. T. Nye, mayor, is planning the erection of a municipally owned artificial ice plant to cost about $500,000.

Herbert R. Averill, Earnest E. Gillard, B. Franklin Posey and others have organized a company at York, Pa., to manufacture automobiles to sell for $700. This company will erect a plant.

Hefner & Maysilles, founders and machinists, Grafton, W. Va., are interested in a complete iron and brass foundry equipment, including tables, saws, shapers, lathes, drills, presses, etc.

Neptune Hardware Mfg. Co., Norwalk, Conn., has taken out building permits for the erection of two factory buildings, one 25 x 100 feet, one-story and the other 60 x 60 feet, with an extension, 20 x 200 feet, two stories.

Plans are being prepared for a new water works system at Middletown, O., to cost $150,000; new equipment will be required throughout.

CARLISLE, KY.—Electric Light & Power Co. is in the market for a 20-ton ice machine, which will be installed early in 1915; M. V. Bastian, manager.

GUTHRIE, KY.—W. E. Rogers and W. O. Nelson will establish a water system.

HARRODSBURG, KY.—George Bohon Co. is building an addition to its vehicle factory, which will be used for blacksmithing purposes.

HARRODSBURG, KY.—Up-to-date Milling Co. will build a plant with a capacity of 50 barrels per week; electric motors will be purchased.

HENDERSON, KY.—Bert L. Baldwin & Co., Cincinnati, have plans for a boiler room to be built for the municipal lighting plant; L. P. Hite, superintendent.

LEXINGTON, KY.—Bluegrass Commission Co. will buy a steel stack, 67 feet x 33 inches.

LEXINGTON, KY.—Fayette Produce Co., recently incorporated at $10,000, will install refrigerating equipment in its plant; address Thomas F. Lynch, general manager.

LEXINGTON, KY. — Louisville & Nashville Railroad Co., which has let contracts for the erection of a roundhouse and shop buildings, will let contracts for the machinery shortly.

LOUISVILLE, KY.—City is planning to erect and equip a garage and automobile repair shop; address board of public works.

LOUISVILLE, KY. — Benzole Garment Cleaning Co. will build a plant next spring, and will install a power plant, with generator, for the operation of electric motors and special machinery.

MATER, KY.—Elkhorn Coal Co. is in the market for power and conveying equipment for a coal mine; address J. Henry Hall.

PARIS, KY.—Y. M. C. A. building to cost about $70,000 will be erected here in the near future. The building will be of fireproof construction and reinforced with steel, of which about 300 tons will be required; Cullen & Vaughn, of Hamilton, O., have been awarded the general contract for this work.

PRINCETON, KY.—City will vote Nov. 3 on $15,000 bonds for the erection of an electric light plant; R. W. Lisanby, mayor.

VINE GROVE, KY.—Rex Revolving Light Co. has been incorporated; $15,000; by J. R. Davis, W. Dennis Carter, Ullie Richardson.

BLOOMINGTON, IND.—E. R. Riedel, 17 Aetna Trust Building, Indianapolis, is making plans for a city hall and fire station of steel and stone, 60 x 120 feet, three stories, for the city.

FERDINAND, IND. — Waterworks Co., power, heat, water and light, has been incorporated; $21,000; by E. E. Schreifer, W. R. Sauer, J. A. Sinderman, et al.

GOSHEN, IND.—Sheet Metal Specialty Co. has begun the construction of a 40 x 200-foot, brick factory building.

INDIANAPOLIS, IND.—Perfection Spring Wheel Co., manufacturer has been incorporated; $50,000; by Harry Weill, Max Weill and George V. Stein, Indianapolis; Austin Cabel and Bret Cabel, Washington, Ind.

MICHIGAN CITY, IND.—Jack Rabbit Co., manufacturer of mechanical toys, has been incorporated; $12,500; by Frank R. Warren, Levi La Gess, Floyd C. Thompson.

MUNCIE, IND. — Contracts have been signed which insures South Muncie will be the location chosen for the Warren G. Bricht Horse Shoe Co.'s factory; Cyrus W. Webb, president.

NEW ALBANY, IND.—Mill City Cotton Mills has begun the construction of a building for the manufacture of textiles; address J. E. Riley Jr.; all of those interested are colored.

SHELBYVILLE, IND. — Edward Mings, contractor, is taking preliminary steps towards the construction of the Warerobe factory, recently destroyed by fire; it will be larger than the one destroyed and will be equipped with new machinery.

SOUTH BEND, IND.—Babcock Brass Co., manufacturer, has been incorporated; $15,000; by Martin L. William, Royal E. Babcock, John P. Russell.

WALTON, IND. — Urmston-Harting Elevator Co. has been incorporated; $16,000; by Leroy Urmston, Sherman B. Harting, Chessel W. Urmston.

CHICAGO.—Century Auto Top & Supply Co. has been incorporated; $10,000; by B. M. Goff, C. A. Wever, 5635 Calumet avenue.

CHICAGO.—Graham Burnham Co., 80 East Jackson Blvd., is preparing plans for an office building at Wabash and Jackson, 120 x 130 feet, ten stories or more, steel frame.

CHICAGO.—Holabird & Roche, architects, 134 South Michigan avenue, have plans for a store and office building for Buck & Rayner, State and Adams streets, 40 x 90 feet, eight stories, steel frame.

CHICAGO.—Anchor Brake & Mfg. Co., brake shoes and railroad supplies, has been incorporated; $50,000; by Arthur M. Kracke, Edmund P. Kelly and Richard G. Brennan, 209 South LaSalle street.

CHICAGO.—Clinton Steel & Wire Co. is having plans prepared for a $60,000, three-story, 75 x 125-foot factory building on the east side of Peoria street, between Washington and Randolph streets.

CHICAGO.—Darling & Eitel, 109 North Dearborn street, are taking bids for a store building, 60 x 100 feet, 17 stories of steel and brick at Fifth Avenue and Randolph street, for Irvin Shuman, Federal Building, Chicago.

CHICAGO.—Board of education, John A. Guilford, manager, 7 South Dearborn street, is preparing to build Chicago Lawn school, Sixty-fifth place and South Homan avenue. Will require considerable structural steel and iron work.

HAMILTON, ILL.—It is reported Johnson Smelting Co., of Connecticut, will erect a $150,000 plant here as soon as a site can be decided upon.

KANKAKEE, ILL. — Frank D. Whipp, fiscal superintendent board of administration, Springfield, has complete plans for a blacksmith shop at the state hospital here. Will be 25 x 30 and 25 x 60 feet and will require usual equipment.

PEORIA, ILL.—Peoria Hydraulic Pump Co. has been incorporated; $20,000; by O. N. Robertson, E. F. Crehore, Clarence W. Heyl.

WAVERLY, ILL.—Waverly Telephone Co. has been incorporated; $35,000; by H. I. DeTurk, A. C. Moffett, A. W. Reagel.

DETROIT.—Varney & Winter will take bids on a three-story, brick and steel factory to be erected at Baltimore and Woodward streets.

DETROIT.—National Electric Starter Co. has been incorporated; $10,000; by Trevor S. Murton, Harold K. Murton, Frederick M. Guy.

DETROIT.—A. A. Albrecht Co. was granted a permit for the Detroit Lumber Co.'s $15,000, 55 x 120 power house on Jefferson avenue, near Campbell.

FREMONT, MICH.—Fremont Canning Co. is taking bids on a canning factory 86 x 143 feet, three stories, reinforced concrete.

GRAND RAPIDS, MICH.—Ottawa Leather Co. will begin to erect a 200-foot addition to its Japanning department shortly.

GRAND RAPIDS, MICH. — Michigan Washing Machine Co. has increased its capital from $60,000 to $100,000.

IRON RIVER, MICH.—Allen & Curtis, Saginaw, are preparing plans for a town hall requiring structural steel.

MIDLAND, MICH.—Guillot Metal Casket Co. was badly damaged by fire.

ST. JOSEPH, MICH.—Upton Machine Co. has increased its capital from $30,000 to $75,000.

DENMARK, WIS.—Foeller & Schober are preparing plans for a $10,000 two-story, 60 x 100-foot, addition to the plant of the Denmark Condensed Milk Co.

GREENBAY, WIS.—Frank D. Fosha has broken ground for a garage and service station, 50 x 100 feet; complete garage equipment will be required.

GREEN BAY, WIS.—Plans for John Hoberg Paper Co.'s $35,000 addition to its papermaking and finishing department have been started by Anderson & Williams; it will be three stories, 40 x 164 feet. Previously noted.

HORICON, WIS.—Horicon Truck Co. has been incorporated to manufacture automobile trucks; $100,000; by Mackie Wells, B. H. Tallmadge, John R. Dietrich.

MADISON, WIS.—It is reported that the supervising architect, treasury department, Washington, D. C., is planning a $550,000 federal court and postoffice building on a 132 x 198-foot site in Madison; it is expected that work will begin about April 1, 1915.

MILWAUKEE.—Plans for the Mitchell exchange at Third avenue and Mitclell street are being prepared by A. C. Eschweiler.

MILWAUKEE. — Motor Supply & Mfg. Co., automobile supplies and accessories, has been incorporated; $25,000; by Warren L. Mayer, William A. Carr, Perry D. Mayer.

MILWAUKEE. — Rayfield Cyclecar Co., Christman, Ill., is negotiating with the business men's associations of Neenah, Green Bay, and Manitowoc, Wis., with a view to locating its plant.

OXFORDVILE, WIS.—Village has granted a franchise to the Oxfordville Light & Power Co. to erect a lighting plant; address village clerk.

STEVENS POINT, WIS. — Bukolt Mfg. Co., maker of mechanical appliances and metal specialties, has purchased an 80 x 150-foot tract and plans to erect an addition this fall or early next spring.

TIGERTON.—Tigerton Electric Co. has been incorporated; $10 000; by Louis Bucksieb, Tillie Swanke, etc.; company will establish an electric light and power plant in Tigerton.

TWO RIVERS, WIS.—Onlie Kocker Co., incorporated at $25,000 to manufacture aluminum cooking utensils, steel cabinets and office furniture, will erect a plant; incorporators are I. E. Miller, Frank Riley, et al.

EDGERTON, MO.—McComas Hydro-Electric Co. has been incorporated; $50,000; by Joseph M. McComas, George W. Johnson, Frank Davis.

EDWARDSVILLE, MO.—American Standard Automobile Co., capital $100,000, is erecting a 50 x 550-foot factory here.

ELSBERRY, MO.—James C. Welch, secretary of supervisors of the Elsberry draining district will receive bids until 1 p. m., Oct. 24 for a steam driven pumping plant, containing two 48-inch centrifugal pumps, each having a normal capacity of 59,000 gallons per minute.

LINCOLN, MO.—County court has approved a bill providing for a steel bridge at the Keseman crossing; J. A. Dice, ex officio highway engineer, will be in charge.

ROSERALE, MO.—Council will rebuild at once the six bridges over Turkey creek, which were washed away in a recent flood.

SHREWSBURG, MO.—Mutual Press Brick Co. has been incorporated; $50,000; by Charles J. Zimmerman, Frank Frommeyer, Charles W. Shafer.

SMITHVILLE, MO.—City voted Sept. 29 on the construction of an electric light system; address mayor.

ST. LOUIS.—Laclede Gas Light Co. has

a permit for a $25,000, one-story building to contain coke ovens; H. Koppers Co., Chicago, has general contract.

ST. LOUIS.—J. P. Materne Mfg. Co.'s plant, valves, steam-fitters' supplies, was damaged by fire; loss about $7,000.

ST. LOUIS.—Ford Motor Car Co. has a permit to make alterations to its service station at 4100 Forest Park boulevard, to cost about $20,000.

MUSCATINE, IA.—Plans are under way for a large addition to the Ziedler concrete culvert plant, to be used for the manufacture of small sized tile.

MUSCATINE, IA.—Barry Mfg. Co., maker of pearl button machinery, will also manufacture steel pulleys and has let a contract for a 3-story, 140 x 400-foot, fireproof structure; estimated cost of building and equipment is more than $100,000.

FORT MADISON, IA.—Madison First association has secured another industry for Fort Madison; it will occupy the Old Reliable Foundry building and manufacture lighting fixtures and metal specialties.

OELWEIN, IA.—Oelwein Light, Heat & Power Co's plant was badly damaged by fire, estimated loss $40,000.

CEYLON, MINN.—Village authorities are taking bids on the general contract for a municipal electric lighting plant; a one-story, concrete block, 25 x 50-foot building is estimated to cost $8,000; Earl D. Jackson, Capital Bank building, St. Paul, engineer.

MINNEAPOLIS, MINN.—Diamond Iron Works, Eighteenth avenue north and Second street, was damaged by fire.

ST. PAUL, MINN.—People's Coal & Ice Co. will erect a $100,000 artificial ice plant in Merriam park, to have a capacity of 100 tons per day.

ST. PAUL, MINN.—A permit has been issued for a $15,000, brick and concrete power house for the new Catholic cathedral to be located at Selby and Farrington avenues.

TYLER, MINN.—North Star Concrete Co. is taking steps to remodel and enlarge its plant.

SOUTHERN STATES

NORFOLK, VA. — Coco Cola Bottling Works has purchased property at Duke street and College place, and will erect a $40,000 plant; W. Leggett, president.

RICHMOND, VA.—Dark Tobacco Co. will install steam power equipment, presses, etc., in a tobacco warehouse which it will build at Bowling Green, Ky.

ASHEVILLE, N. C.—French Broad Mfg. Co., textile, plan erecting additions to its plant, which will more than double the capacity.

HELENA, GA.—City votes Oct. 17 on $13,000 bonds to construct an electric light system and water works; address mayor.

TAMPA, FLA.—Southern Roofing Co.; capital, $10,000; will install machinery to manufacture reversible lock and surface tin shingles; J. T. Tucker, president.

ALEXANDER CITY, ALA.—Bettie Francis Cotton Mills will construct an 80 x 100-foot main building and a 55 x 55-foot warehouse; 8,000 spindles and accompanying machinery will be installed; Benjamin Russell, president.

BIRMINGHAM, ALA.—Secretary F. N. Phillips says the Birmingham Packing Co. will erect an addition to its ice plant, to cost about $65,000.

DENISON, IA.—Denison Bottling Works has secured a site for a two-story bottling works; a complete steam plant will be installed.

FORT DODGE, IA.—Paul Horn is planning to erect a two-story, brick, mill-working plant; in this city.

NEW ORLEANS, LA.—P. G. Ricks, commissioner of public finances, will receive bids until 11 a. m., Oct. 26, for a Strauss bascule lift bridge, over the New Basin canal.

NEW ORLEANS.—Mexican Petroleum Oil Co., J. Oswald Boyd, local manager, will build a refinery at Rost, La.; it is reported the plant will cost $500,000.

NEW ORLEANS.—F. S. Shields, secretary of city board, will receive bids until noon, Dec. 1, for riveted steel pipe, 5 feet and 12 feet in diameter; approximate weight, 150,000 pounds.

SIOUX CITY—Northwestern Mfg. Co. has been incorporated to make cement products machinery; $50,000; by L. L. Stamm, H. K. Hansen, J. H. Lawrence, M. L. Sears, H. S. Snyder.

BEAUMONT, TEX.—Beaumont Cotton Oil Co. was badly damaged by fire; loss, about $25,000, is insured.

BEAUMONT, TEX.—Texas Sheet Iron & Culvert Works, has been incorporated; $3,000; by J. T. Booth, J. R. Gallagher, R. W. Sutton.

GAINESVILLE, TEX. — B. F. Johnson, secretary of the chamber of commerce, announced that a $500,000 cotton mill will be erected in Gainesville.

GREENVILLE, TEX.—Chamber of Commerce has indorsed plans for the organization of a $150,000 textile plant for Greenville.

NACOGDOCHES, TEX. — John Schmidt and others have applied for a charter to erect a grain elevator; capital $20,000.

PAOLA.—W. E. Gillham Engineering Co., 409 Reliance building, Kansas City, is taking bids on construction and equipment of an academy building and power house, 60 x 87 feet with extension 19 x 52 feet, three stories, reinforced concrete.

KNOXVILLE, TENN.—Southern Locomotive Valve Gear Co. is reported to have plans for the establishment of a foundry and machine shop; address H. P. Strayer, Empire building.

MEMPHIS, TENN.—Atlas Garage & Machine Co., will buy a 14-inch x 8-foot American quick change lathe and a small gear cutter; J. C. Scott, manager.

MEMPHIS, TENN. — Arkansas Light & Power Co. is planning extensive improvements to its present plants and expects to add to the number of its plants.

ROGERSVILLE, TENN. — Planing mill operated by John Walker was burned with $10,000 capital loss; A. B. Rogan owned the property.

GRANITE, OKLA.—Greer county farmers plan a $150,000 cotton mill.

WESTERN STATES

LINCOLN, NEB.—City will install new machinery at the A street well and power plant; part will be installed this month and City Commissioner Schroeder thinks that the remainder will be installed before spring.

GREAT FALLS, MONT.—Plans for a steel pressure pipe for conducting water over the Sun river for the Sun river irrigation project have been completed.

WIBAUX, MONT.—Voters will decide upon granting a franchise to Henry Zolphi for an electric lighting and heating plant, estimated to cost $20,000.

DOUGLAS, ARIZ.—Robert Stoker, Salt Lake City, Utah, is negotiating with the chamber of commence with a view of locating a foundry here.

CALDWELL, IDA.—County commissioners will call for bids soon for a 48-foot steel bridge over Willow creek; Fred H. McConnell, county engineer.

LEWISTOWN, IDA.—R. C. Dalheim and associates are to ask for a franchise for an electric railway in Clarkston, Wash., and Lewiston, the road to be completed before 1916.

PECK, IDA. — P. S. Lantry, Spokane, Wash., will erect a 50-barrel flour mill and electric light plant here to cost about $20,000.

SPENCER, IDA.—Wood Livestock Co., F. J. Hagenberth, president, has been granted a permit for operating an electric generating plant and distributing system.

WALLACE, IDA.—George R. Trask, county engineer, says that plans for the proposed Howe truss bridge across the river near Kellogg are practically completed and bids will be called for at once.

IONE, WASH.—Ione Lumber & Pole company will begin the construction of a planing mill shortly.

IONE, WASH.—It is reported that J. B. Cavanaugh will superintend the erection for a 100,000-foot daily capacity sawmill at the head of the Big Muddy river.

SEATTLE, WASH.—Council has appropriated $10,000 to be used in preparing plans for a bridge across Lake Washington canal.

SEATTLE, WASH.—Lighting department's allowance for October includes $40,000 for the purchase of cables for an underground system; an additional boiler will probably be purchased for the steam power plant on Lake Union.

PORTLAND, ORE.—Council has granted a 25-year franchise to Portland & Oregon Electric Railway Co.; Stephen A. Carver, president.

NEW CATALOGS

FUEL OIL BURNING APPLIANCES.—In a 32-page catalog issued by Tate, Jones & Co., Pittsburgh, its line of burners for fuel oil is illustrated and described. Numerous views also are included showing the application of these burners to various types of furnaces. Pumping systems also are shown and details of operation are included.

DRINKING WATER SYSTEMS.—A catalog describing the Nonpareil core covering for drinking water systems in mills, factories, hotels, office buildings and hospitals has been issued by the Armstrong Core & Insulation Co. Illlustrations are shown of this cover in service in various factories and buildings. The method of preparing this covering and the advantages of its use are described in detail.

BALL BEARINGS.—The Maschinenfabrik Rheinland, Aktien-Ges., Dusseldorf, Germany, with offices at 1377 Broadway, New York, has issued a large size, two color, 70-page catalog, giving a complete description of its line of ball bearings. The catalog is profusely illustrated and carries a large number of tables which will prove of value. It is bound in a loose-leaf, flexible cover, which adds greatly to its attractiveness.

CUTTING-OFF MACHINES.—The Nutter & Barnes Co., Hinsdale, N. H., recently has published a 55-page catalog describing and illustrating its line of automatic metal cutting-off machines and saw and cutter sharpeners. The different types of machines manufactured by the company are illustrated and on the facing page complete specifications for these machines are given. The catalog contains the descriptions of a number of new features which the company recently has added to its line and will prove of value to all users of this type of equipment.

CHAIN GRATE STOKERS.—Babcock & Wilcox Co., New York, recently has issued a new catalog describing its chain grate stokers. In common with the other Babcock & Wilcox publications, this catalog is durably bound in boards and is printed in an unusually attractive manner. A large number of half-tone cross sections of chain grate installations in boilers are used to illustrate the book. Several pages are devoted to an article on the general subject of automatic stokers. The advantages of chain grate stokers are also pointed out clearly.

IRON AND STEEL PRICES

Corrected up to Tuesday noon

PIG IRON

(Delivery This Year.)

Bessemer, valley	$14.00
Bessemer, Pittsburgh	14.90
Basic, Pittsburgh	13.90
Basic, eastern Pa.	14.00
Malleable, Pittsburgh	13.90 to 14.40
Malleable, Chicago	13.25 to 13.75
Malleable, Philadelphia	15.50 to 16.00
Malleable, Buffalo	12.75 to 13.00
No. 1X Philadelphia	15.00 to 15.25
No. 2 foundry, Pittsburgh	13.90 to 14.40
No. 2 foundry, Cleveland	13.75
No. 2 foundry, Ironton	13.00 to 13.50
No. 2 foundry, Chicago	13.50 to 14.00
No. 2X foundry, Philadelphia	14.75 to 15.00
No. 2X fdy., (N. J. tidewater)	14.50 to 14.75
No. 2X foundry, Buffalo	12.75 to 13.00
No. 2 plain, Philadelphia	14.50 to 14.75
No. 2 plain, (N. J. tidewater)	14.25 to 14.50
No. 2 plain, Buffalo	12.75 to 13.25
No. 2 southern, Birmingham	10.00 to 10.50
No. 2 southern, Cincinnati	13.25 to 13.75
No. 2 southern, Chicago	14.60 to 14.85
No. 2 southern, Philadelphia	14.50 to 15.00
No. 2 southern, Cleveland	14.00 to 14.50
No. 2 southern, New York	14.75 to 15.00
No. 2 southern Boston, docks	14.25 to 14.75
No. 2 south'n interior New Eng.	15.00 to 16.50
No. 2 southern, St. Louis	14.00 to 14.25
Virginia, 2X, Philadelphia	15.00 to 15.25
Virginia, 2X, Jersey City	15.30 to 15.75
Virginia, 2X, New Eng., all rail	15.75 to 16.25
Malleable, Southern Pa.	13.50 to 13.75
Gray forge, Pittsburgh	13.65
Gray forge, Birmingham	9.00 to 9.50
Silveries, 8 per cent, Cleveland	17.55
Silveries, 5 per cent Birmingham	12.80
Silveries, 2 per cent, Chicago	16.35
Standard low phos., Pbtl	21.00 to 21.50
Lebanon low phos., furnace	17.00 to 17.50
Low phos., Pittsburgh	21.15 to 21.40
Charcoal, Lake Superior, Chgo.	
Nos. 1 to 4	15.25 to 16.50
Charcoal, Buffalo	15.75 to 16.75
Charcoal, Birmingham	25.00

IRON ORE

(Lower lake ports.)

Old range, Bessemer, 55 per cent	$4.75
Mesabi Bessemer, 55 per cent	4.60
Old range, non-Bess., 51½ per cent	3.90
Mesabi non-Bessemer, 51½ per cent	3.85

(Per unit, Philadelphia.)

Foreign Bess., 50 to 65 per cent	7c
Foreign non-Bess., 50 to 65 per cent	7c

COKE

(At the ovens.)

Connellsville furnace	$1.65 to 1.75
Connellsville fur. contr.	1.65 to 1.75
Connellsville foundry	2.25 to 2.35
Connellsville fdy., contr.	2.25 to 2.50
Wise county furnace	1.85 to 2.10
Wise county foundry	2.25 to 2.75
Pocahontas furnace	1.80 to 2.05
Pocahontas foundry	2.25 to 2.40
New River, foundry	2.75 to 3.50
New River, furnace	2.20 to 2.35

FERRO-ALLOYS

Ferro-manganese, Baltimore	$68.00
Ferro-silicon, 50 per cent, Pbgh.	71.00 to 73.00
Ferro-silicon, 50 per cent, Phila.	71.00 to 73.00
Ferro-sil., 12 to 13 per cent, Pgh.	22.90
Ferro-sil., 11 to 12 per cent, Pgh.	21.90
Ferro-sil., 10 to 11 per cent, Pgh.	20.90
Ferro-sil., 9 to 10 per cent, Pgh.	19.90
Ferro-carbon titanium, carloads, per lb.	8c to 12½c

SEMI-FINISHED STEEL

Billets, Pbgh. and Yn.	$21.00
Open-hearth bil., Phila.	22.40
Sheet bars, Pittsburgh and Yn.	22.00
Forging billets, Phila.	25.40 to 26.40
Forging billets, Pittsburgh	26.00
Wire rods, Pittsburgh	26.00

RAILS AND TRACK MATERIAL

Stand. Bess., rails, Pbgh.	1.25c
Stand. open-hearth rails, Pbgh.	1.34c
Light rails, 8 lbs., Pbgh. or Chi.	1.40c
Lgt. rails, 12 lbs., Pbgh. or Chgo.	1.35c
Lgt. rails, 16 to 20 lb., Pbgh. or Chicago	1.30c
Lgt. rails, 25 to 45 lbs., Pbgh. or Chicago	1.25c
Relaying rails, standard, Chgo.	$23.00 to 24.00
Relaying rails, light, Chicago	21.50 to 22.50
Angle bars, st. sect. Pbgh. base	1.50c
Angle bars, st. sections, Chgo.	1.50c
Spikes, railroad, Pbgh.	1.40c to 1.45c
Spikes, railroad, Chgo.	1.55c
Track bolts, Pbgh.	2.00c
Track bolts, Chgo.	2.00c

SHAPES, PLATES AND BARS

Structural shapes, Pittsburgh	1.15c to 1.20c
Structural shapes, Chicago	1.30c to 1.38c
Structural shapes, Philadelphia	1.30c to 1.35c
Structural shapes, New York	1.31c to 1.36c
Structural shapes, San Francisco	2.00c to 2.05c
Tank plates, Chicago	1.30c to 1.38c

Freight Rates, Finished Material

From Pittsburgh, carloads, per 100 pounds to:—

New York	16 cents
Philadelphia	15 cents
Boston	18 cents
Buffalo	11 cents
Baltimore	14½ cents
Cleveland	10 cents
Cincinnati	15 cents
Chicago	18 cents
Minneapolis and St. Paul	32 cents
Denver	67½ cents
St. Louis	22½ cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast, (all rail)	80 cents
Pacific coast, via Panama can'l	46 cents

Tank plates, Pittsburgh	1.15c to 1.20c
Tank plates, Philadelphia	1.30c to 1.35c
Tank plates, New York	1.31c to 1.36c
Bars, soft steel, Pittsburgh	1.15c to 1.20c
Bars, soft steel, Chicago	1.30c to 1.38c
Bars, soft steel, Philadelphia	1.30c to 1.35c
Bars, soft steel, New York	1.36c
Hoops, carloads, Pittsburgh	1.25c to 1.30c
Hoops, less carloads, Pittsburgh	1.30c to 1.35c
Bands, Pittsburgh	1.20c
Shafting, carloads, Pbgh., disc. contract	66
Shaft'g less carl'ds, Pbgh., disc.	63
Bar iron, Chicago	1.02½c to 1.07½c
Bar iron, Philadelphia	1.15c to 1.20c
Bar iron, New York	1.20c to 1.30c
Bar iron, Cleveland	1.20c
Bar iron, Pittsburgh	1.20c to 1.25c
Hard steel bars, Chicago	1.25c to 1.30c
Smooth finish. mchy. steel, Chi.	1.68c

SHEETS AND TIN PLATE

No. 28, black, Pittsburgh	1.95c to 2.00c
No. 28, black, Chicago	2.13c to 2.18c
No. 28, tin mill, black, Pbgh.	1.95c
No. 28, galvanized, Pbgh.	2.95c to 3.00c
No. 28, galvanized, Chgo.	3.13c to 3.18c
No. 10, blue, annealed, Pbgh.	1.40c to 1.45c
No. 10, blue, annealed, Phila.	1.60c
Tin plate, 100 lb., coke, base	$3.40 to 3.50

EXTRAS FOR SHEET OR TIN MILL SPECIFICATIONS

(Per hundred pounds.)

Single pickled, cold roll., and re-an.	30 cents
Hot roll'd, pickl'd and ann., tin mill	25 cents
Full pickled, cold rolled and re-ann.	50 cents
Auto sheets	75 cents
Blued stove pipe stock	10 cents
Range steel	30 cents
Re-squaring	10 cents
Roller levelling	10 cents
Patent levelling and re-squaring	35 cents
Oiling sheets	10 cents
Deoxidizing	10 cents
Lime finish	10 cents
Open hearth steamping steel, free from mill scale	55 cents
Special open hearth deep stpg. steel free from mill scale	80 cents
Extra deep special auto body stock	$1.25
Ext. for 28 gage ov. 32 to 36-in. wide	10 cents
No reduction for sheets not annealed	

The above extras apply on both sheet and tin mill specifications, at the same rate.

IRON AND STEEL PIPE

(Pittsburgh.)

	Black Butt-weld.	Galv. Butt-weld.
Steel, ⅜ to 3 inches	80	71½
Iron, ⅜ to 2½ inches	70	61
	Lap-weld.	
Steel, 2½ to 6 inches	79	70½

BOILER TUBES

Steel, 3½ to 4½ inches	73
Iron, 3½ to 4½ inches	60

WIRE PRODUCTS

Wire nails, jobbers, Pittsburgh	$1.60
Wire nails, retailers, Pittsburgh	1.65
Plain wire, jobbers, Pittsburgh	1.40
Plain wire, retailers, Pittsburgh	1.45
Galvanized wire, jobbers, Pbgh.	1.80
Galvanized wire, retailers, Pbgh.	1.85
Polished staples, Pbgh.	1.60
Galvanized staples, Pbgh.	2.00
Barb wire, painted, jobbers, Pbgh.	1.60
Barb wire, painted, retail'rs, Pbgh.	1.65
Barb wire, galv., retail's, Pbgh.	2.05
Barb wire, galv., jobbers, Pbgh.	2.00

BOLTS AND NUTS

(Delivered within 20-cent freight radius.)

Carriage bolts, ⅜ x 6 inches, smaller or shorter, rolled threads, 80 and 20; cht threads 80 and 15; larger or longer, 75 and 15.

Machine bolts with hot pressed nuts ⅜ x 4 inches, smaller or shorter, rolled, 80 and 25; cut, 80 and 20; larger or longer, 80.

Gimlet and cone point lag or coach screws, 80 and 25.

Hot pressed square, blank or tapped nuts, $6.30 off list; hot pressed hexagon blank or tapped, $7.20 off.

Cold pressed, c. and t. square, blank or tapped, $6 off; hexagon, blank or tapped, ⅜ inch and larger, $7.20; ⅜-inch and smaller, $7.80.

RIVETS

Structural rivets, Pbgh.	1.50c
Structural rivets, Chgo.	1.68c
Boiler rivets, Pbgh.	1.60c
Boiler rivets, Chgo.	1.78c

SCREWS

(New York.)

Lag, gimlet and cone point	80 and 20
Coach, gimlet point	80
Standard Jack	70 and 10
Mch., cut thread, flat head	50 and 10
Mach., cut threal, round head	50 and 10 and 10
Mch., cut thread, fillister hd.	40 and 40 and 10
Mch. rolled thread, flat head or round head	80 and 10
Set screws, iron	75 and 10 and 10
Set screws, steel, per cent advance over iron	25
Square head cap screws	70 and 10 and 10
Hexagon head cap screws	70 and 10 and 10
Fillister head cap screws	60 and 10 and 10
Flat head wood screws	10 and 10 and 5
Round head wood screws	10 and 10 and 5

CAR WHEELS

33-inch engine truck wheels	$22.50
36-inch engine truck wheels	23.50
33-inch tender wheels	18.30
36-inch passenger train car and tender wheels	21.50
33-inch freight car wheels	15.50

All with standard 2½ inch rims and minimum standard hubs, usual extras applying for thicker rims and larger hubs; all f. o. b. cars, Pittsburgh.

IRON AND STEEL PRICES

Corrected up to Tuesday noon

STEEL SHEET PILING

(Pittsburgh.)

Base sizes	1.55c to 1.60c

TWISTED REINFORCING BARS

(Soft steel, Pittsburgh mill.)

¾-inch and larger	1.25c
⅝-inch	1.30c
½-inch	1.35c
⅜-inch	1.50c
¼-inch	1.75c

TACKS

(New York.)

	Discount.
American carpet tacks.	90 and 20 and 10 and 10
American cut tacks...	90 and 20 and 10 and 10
Railroad tacks	90 and 50 and 10
Gimp tacks	90 and 20 and 10 and 10
Finishing nails	70

WIRE ROPE

Galvanized, iron and steel	47½ and 2½
Bright, iron and steel	55 and 2½

COLD ROLLED STRIP STEEL

(Subject to regular extras.)

Base price Cut to length		0.10 to 0.19 Carbon
Hard.	Soft.	1½ in. and wider.
2.85	3.10	0.100 and thicker.
2.95	3.20	0.050 to 0.099 inc.
3.10	3.35	0.035 to 0.049 inc.
3.35	3.75	0.031 to 0.034 inc.
3.60	4.00	0.025 to 0.030 inc.
3.80	4.20	0.020 to 0.024 inc.
4.70	5.20	0.017 to 0.019 inc.
5.10	5.60	0.015 and 0.016
5.95	6.45	0.013 and 0.014
6.55	7.05	0.012
6.90	7.40	0.011
7.25	7.75	0.010
Coils		
2.75	3.00	0.100 and thicker
2.80	3.05	0.050 to 0.099 inc.
2.95	3.20	0.035 to 0.049 inc.
3.10	3.50	0.031 to 0.034 inc.
3.20	3.60	0.025 to 0.030 inc.
3.30	3.70	0.020 to 0.024 inc.
3.60	4.10	0.017 to 0.019 inc.
4.00	4.50	0.015 and 0.016
4.70	5.20	0.013 and 0.014
5.05	5.55	0.012
5.40	5.90	0.011
5.75	6.25	0.010

CAST IRON PIPE

Three to 24 in., Cleveland	$22.35 to 22.80
Four-inch, water, Chicago	26.50
Six to 12 inches, Chicago	24.50
Larger sizes, Chicago	24.00
Six-inch, water, New York	20.50 to 21.00
Four-inch, water, Birmingham	19.50
Six-inch and larger, Birmingham.	19.50
Gas pipe, $1 per ton higher than water.	

WAREHOUSE PRICES

Steel bars, Chicago	1.65c
Steel bars, Cleveland	1.80c
Steel bars, Cincinnati	1.70c to 1.85c
Steel bars, Philadelphia	1.70c to 1.75c
Steel bars, New York	1.80c
Steel bars, St. Louis	1.70c
Iron bars, Chicago	1.65c
Iron bars, Cleveland	1.75c
Iron bars, St. Louis	1.65c
Iron bars, Cincinnati	1.65c to 1.75c
Iron bars, Philadelphia	1.70c
Iron bars, New York	1.65c to 1.70c
Hoops, Chicago	2.15c
Shapes and plates, Chicago	1.75c
Shapes and plates, Cleveland	1.90c
Shapes and plates, Cincinnati	1.80c to 1.90c
Shapes and plates, St. Louis	1.80c
Shapes and plates, Philadelphia	1.70c to 1.75c
Shapes and plates, New York	1.85c
No. 10 blue ann. sheets, Chgo.	1.95c
No. 10 blue ann. sheets, Cleve.	2.05c
No. 10 blue ann. sh., St. Louis	2.00c
No. 10 blue ann. sheets, Cinci.	1.95c
No. 28 black sheets, Chgo.	2.55c
No. 28, black sheets, Cleveland.	2.45c
No. 28 black sheets, Cincinnati.	2.45c to 2.55c
No. 28 black sh., St. Louis	2.55c
No. 28 galv. sheets, Chgo.	3.55c
No. 28 galv. sheets, Cleveland.	3.35c
No. 28 galv. sheets, Cincinnati.	3.40c to 3.55c
No. 28 galv. sheets, St. Louis.	3.55c

IRON AND STEEL SCRAP

(Net Tons.)

No. 1 railroad wrought, Chgo.	$ 7.75 to 8.00
No. 1 railroad wrought, Cleve.	9.50 to 10.00

Freight Rates, Coke

Connellsville regions, per 2,000 lbs., to:—

Baltimore	$1.80
Buffalo	1.85
Chicago	2.50
Cleveland	1.60
Detroit	2.10
East St. Louis	2.80
Joliet	2.50
Louisville	2.50
Milwaukee	2.70
New York	2.85
Philadelphia	2.05
Pittsburgh	.75
Richmond, Va.	2.94
Toledo	1.85
Valley Furnaces	1.20
Cincinnati	2.00

No. 1 railroad wrought, St. L.	7.25 to 7.50
No. 1 railroad wrought, Cinci.	8.00 to 8.50
No. 2 railroad wrought, Chgo.	7.25 to 7.50
No. 2 railroad wrought, St. L.	7.00 to 7.25
Arch bars and transoms, Chgo.	11.00 to 11.50
Arch bars and transoms, St. L.	10.50 to 11.00
Knuckles, coup. & spr'gs, Chgo.	9.00 to 9.25
Knuckles, coup. & spr'gs, St. L.	8.25 to 8.50
Shafting, Chicago	11.50 to 12.00
Shafting, St. Louis	12.50 to 13.00
Steel car axles, Chgo.	10.75 to 11.25
Steel car axles, St. Louis	10.25 to 10.50
Locomotive tires, Chicago	9.00 to 9.50
Locomotive tires, St. Louis	8.25 to 8.75
Cut forge, Chicago	7.25 to 7.50

Freight Rates via Panama Canal

Rates on finished materials, including plates, shapes, bars, wire, nails, etc., to Pacific coast points via Panama Canal, per 100 lbs., in car load lots, exclusive of insurance and dockage.

From New York	$0.30
From Pittsburgh	.46
From Youngstown	.48
From Niles	.48
From Wheeling	.46
From Steubenville	.46
From Johnstown	.44½
From Coatesville	.39
From Steelton	.40
From Bethlehem	.37½
From Cleveland	.49
From Chicago	.60

Pipes and flues, Chicago	$ 5.50 to 5.75
Pipes and flues, Cleveland	7.75 to 8.25
Pipes and flues, St. Louis	5.25 to 5.50
No. 1 cast, Chicago	9.25 to 9.50
No. 1 cast, Cleveland	10.00 to 10.50
No. 1 cast, Cincinnati	8.50 to 9.00
No. 1 cast, St. Louis	9.00 to 9.50
No. 1 busheling, Chicago	6.50 to 6.75
No. 1 busheling, Cleveland	8.25 to 8.50
No. 1 busheling, Cincinnati	5.75 to 6.25
No. 1 busheling, St. Louis	6.75 to 7.00
No. 2 busheling, Chicago	5.25 to 5.75
No. 1 boiler plate, cut Chgo.	6.25 to 6.75
No. 1 boiler plate, cut, Buffalo.	9.00 to 9.50
No. 1 boiler plate, cut, St. L.	5.50 to 6.00
Boiler punchings, Chicago	8.50 to 9.00
Cast borings, Chicago	4.75 to 5.25
Cast borings, Cleveland	5.75 to 6.00
Cast borings, Cincinnati	4.25 to 4.75
Cast borings, St. Louis	3.50 to 4.00
Machine shop turnings, Chgo.	4.50 to 4.75
Machine shop turnings, Cleve.	5.25 to 5.75
Machine shop turnings, Cinci.	4.25 to 4.75
Machine shop turnings, St. L.	4.00 to 4.50
Malleable agl., Chicago	7.75 to 8.25
Malleable agricultural, St. Louis	6.25 to 6.50
Malleable, railroad, Chicago	8.25 to 8.50
Malleable, railroad, Cincinnati	6.50 to 7.00
Malleable, railroad, St. Louis	6.25 to 6.50
Angle bars, iron, Chgo.	11.50 to 12.00
Angle bars, iron, St. Louis	9.50 to 10.00
Angle bars, steel, Chgo.	8.25 to 8.75
Angle bars, stel, St. Louis	8.75 to 9.00
Stove plate, Chicago	8.50 to 8.75
Stove plate, Cleveland	7.75 to 8.00
Stove plate, Buffalo	9.00 to 9.75
Stove plate, Cincinnati	6.50 to 7.00
Stove plate, St. Louis	8.25 to 8.75
Bundled sheet, Cincinnati	4.00 to 4.50
Wrought iron pil'g plates, Clev.	13.00

(Gross Tons.)

Heavy melting steel, Pbgh.	$10.75 to 11.00
Heavy melting steel, Buffalo	10.00 to 10.50
Heavy melting steel, Chicago	9.00 to 9.50
Heavy melting steel Cleveland.	9.50 to 10.00
Heavy melting steel, Cincinnati	9.00 to 9.50
H'vy melting steel, eastern Pa.	10.00 to 10.50
Heavy melting steel, New York.	8.00 to 8.25
Heavy melting steel, St. Louis.	10.50 to 11.00
Bundled sheet, Buffalo	6.25 to 6.50
Grate bars, Buffalo	9.00 to 9.50
Grate bars, New York	6.50 to 7.00
No. 1 railroad wr'ght, east. Pa.	11.50 to 11.75
No. 1 railroad wrought, Pbgh.	10.25 to 10.50
No. 1 R. R. wght., New York.	9.25 to 9.50
No. 1 R. R. wrought, Buffalo.	10.00 to 10.50
Shafting, New York	12.50 to 13.00
Pipes and flues, New York	7.75 to 8.25
Pipes and flues, eastern Pa.	10.00 to 10.50
Mch. shop turnings, New York.	6.00 to 6.25
Machine shop turnings, Buffalo.	5.50 to 6.00
Mch. shop turnings, Pbgh.	8.00
Mch. shop turnings, eastern Pa.	8.00 to 8.25
Cast borings, New York	6.00 to 6.25
Cast borings, eastern Pa.	8.00 to 8.25
Cast borings, Buffalo	6.00 to 6.50
Cast borings, Pittsburgh	8.00 to 8.50
Stove plate, (Jersey points)	8.75 to 9.00
Stove plate, Pittsburgh	9.00
Stove plate, eastern Pa.	8.50 to 9.00
Shoveling steel, Chicago	8.75 to 9.00
Shoveling steel, St. Louis	7.50 to 7.75
Reroll'g rails, 5 ft. & ov., Pbgh.	13.00
Reroll. rails, 5 ft. & ov., Chgo.	10.00 to 10.50
Reroll. rails, 5 ft. & ov., Cleve.	11.00 to 11.50
Reroll. rails, 5 ft. & ov., E. Pa.	12.00 to 12.50
Reroll. rails, 5 ft. & ov., St. L.	10.00 to 10.25
Steel rails, short, Chicago	10.00 to 10.25
Steel rails, short, Cleveland	12.50 to 13.00
Steel rails, short, St. Louis	9.50 to 9.75
Iron rails, Cleveland nom.	12.50 to 13.00
Iron rails, Cincinnati	10.25 to 10.75
Iron rails, eastern Pa.	14.00 to 14.50
Iron rails, St. Louis	10.00 to 10.25
Iron rails, Pittsburgh	13.00 to 13.50
Frogs, switches, guards, Chgo.	9.25 to 9.50
Frogs, switches & g'rds, St. L.	9.25 to 9.50
Car wheels, (iron), Pittsburgh.	11.50 to 11.75
Car wheels, (steel), Pittsburgh.	12.75 to 13.00
Car wheels, Chicago	10.50 to 10.75
Car wheels, eastern Pa.	10.50 to 11.00
Car wheels, Buffalo	10.50 to 11.00
Car wheels (N. J. points)	10.00 to 10.50
Car wheels, St. Louis	10.00 to 10.25
Iron axles, Pittsburgh	20.00 to 21.00
Iron axles, Cincinnati	19.00 to 20.00
Iron axles, eastern Pa.	20.00 to 20.50
Iron axles, Buffalo	19.00 to 19.50
Iron axles, Chicago	16.00 to 16.50
Steel car axles, New York	12.50 to 13.00
Steel car axles, Buffalo	12.00 to 12.50
Steel car axles, Cleveland	13.50 to 14.00
Steel car axles, eastern Pa.	14.50 to 15.00
No. 1 busheling, Buffalo	8.25 to 8.75
No. 1 busheling, Pittsburgh	9.00
No. 2 busheling, Buffalo	5.75 to 6.25
Low phosphorus steel, Buffalo.	14.00 to 14.50
Low phosphorus steel, Pbgh.	14.00 to 14.50
Low phos. steel, eastern Pa.	14.00 to 14.50
No. 1 forge, eastern Pa.	8.00 to 8.50
No. 1 cast, eastern Pa.	12.00 to 12.50
No. 1 cast, Pittsburgh	11.00 to 11.50
No. 1 heavy cast (N. J. points)	11.00 to 11.50
Boiler plate, Cleveland	8.50 to 9.00
Mall. iron, agricul., Cleveland.	9.00 to 9.50
Mall. iron R. R., Cleveland.	10.00 to 10.50
Malleable, railroad, Pittsburgh.	9.50 to 10.00
Mall. R. R., Buffalo	9.25 to 9.75
Mall., R. R. east. Pa.	9.00 to 9.50
Bundled sheet, Pittsburgh	8.50 to 8.75
Bundled sheet, Cleveland	7.50 to 8.00

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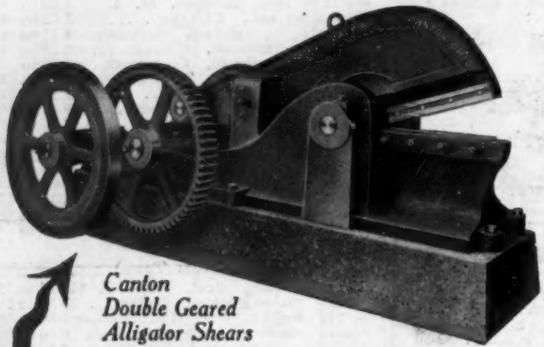
Do you know *why* Canton Alligator Shears are the **most powerful, most well balanced,** and the *smoothest* and *most even running* shears ever built?

Do you know why there is absolutely no chance of *crank or countershaft twisting* on a *"Canton"* Shear?

DOUBLE GEARS, IS THE ANSWER!



Canton Double Geared Alligator Shears

will do more work in less time than any other alligator shears made. Their individual characteristics have marked them everywhere as the *ideal shear.*

"Canton" *Knives* are exceptionally heavy and have four cutting edges. They are made from carefully tempered steel, and will outlast two sets of the ordinary kind.

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THE SUPERIOR FOUNDRY CO., CLEVELAND, OHIO

A Study of Bark on Tool Steel

(*Continued from page 727.*)

variably due to the surface decarbonization of the steel.

A typical example of this difficulty is found in turning twist-drill blanks from the round bar. Here it is sometimes observed that the outside of the bar, to a depth of several thousandths of an inch, is very soft. Beneath this is a ring about ⅛ inch in thickness, so hard that it cuts a nick in the lathe tool. Below this ring the piece is uniformly soft.

Microscopic examination of such a piece reveals that the extreme outside of the bar consists of either ferrite or ferrite mixed with pearlite, which would, of course, machine as easily as machinery steel. The hard ring is found to consist of nearly pure pearlite in very coarse crystalline grains. The soft interior consists usually of finely divided pearlite and globular cementite, which also machines with great ease.

In case a piece of tool steel is being machined in such a way that only a part of this layer of coarse pearlite is removed still greater difficulty is encountered. The surface of the work will be rough and the point of the tool will be worn out with great rapidity. The rapid wearing of the tool makes it impossible to hold a uniform size on any number of pieces of work.

The cause of this layer of coarse crystals is the difference between the critical points of eutectoid and hypereutectoid steel. At the correct temperature for annealing the hypereutectoid steel, the eutectoid is far enough above its critical point to allow the crystalline grains to grow to considerable size.

The fact that eutectoid steel with the pearlite arranged in coarse grains is more difficult to machine than hypereutectoid steel in fine grains seems at first surprising. This is easily explained when we consider the manner in which the steel yields under stress and effect of the various micro-constituents upon the cutting tool.

It has been shown by several investigators that a tool when removing a chip from a piece of metal splits it off by an action similar to a wedge. In this case the hardest wear on the tool occurs not at the extreme point but a short distance back from the point where the pressure of the chip is greatest. It will readily be seen that there is always a crack running ahead of the tool as it is forced through the material that is being cut. When the tool is cutting in coarse pearlite the crack will naturally follow the lines of least resistance. These are the boundary lines of the grains and through the grain in the direction of the laminations. This being the case, it follows that the larger the size of the crystalline grains and the more distinct the lamellar structure, the more irregular will be the crack and the rougher the resulting surface. Such a crack passing through a mass of coarsely crystalline pearlite is shown in Fig. 1.

The very rapid wear on the cutting tool engaged in cutting coarse pearlite is probably due to two causes:

First, the rough surface left by the crack running ahead of the tool greatly increases the amount of work and friction on the extreme cutting edge. The point of the tool is obliged to rub over many protruding grains of pearlite and sometimes to work in and tear others out entirely. The result of this extra work is to round off the cutting edge rapidly and increase the friction, until the point is entirely destroyed by the heat generated.

The second cause of the extreme wear on a cutting tool working in coarse pearlite is the great abrasive quality of cementite when firmly held by the alternate plates of ferrite. The sharp angular plates of hard cementite in coarsely lamellar pearlite have a much greater abrasive action than the rounded masses of globular cementite in well annealed hypereutectoid steel. A grain of coarsely lameller pearlite exhibiting this feature is shown in Fig. 2.

Reduction of Titaniferous Ores

(*Continued from page 726.*)

castings with a large proportion of scrap. The tests indicated that this foundry iron will make a casting slightly stronger, no harder and possibly a little softer. Photomicrographs of foundry iron containing large and small quantities of titanium and also of the titaniferous iron ores of the Lake Sanford district, which were made by the Titanium Alloy Mfg. Co., Niagara Falls, are reproduced in the accompanying illustrations.

No conclusive tests of the behavior of malleable and basic irons made from titaniferous ores now are available. Iron of these grades has been shipped to consumers and its results are being watched but thus far, no complete statement of how it acts, has been obtained. The Lukens Iron & Steel Co., Coatesville, Pa., the Eastern Steel Co., Pottsville, Pa., and the American Iron & Steel Mfg. Co., Lebanon, Pa., have been shipped test lots of basic smelted from these ores and now are trying out this metal.

The Iron Ore Industry in Brazil

(*Continued from page 720.*)

must ultimately be transported from the district.

It seems probable, therefore, that by far the greater part of the ore is destined to leave the district by another route than those mentioned, viz., by the Victoria to Minas Railway, which leaves the sea coast at Victoria and runs up the Rio Doce. This railroad, which is now under construction, will enter the iron ore district from the northeast and will tap first those deposits which are now farthest from lines of transportation. The distance to Victoria from the eastern part of the iron ore district over this route is about 375 miles, the entire distance being on a down grade following the course of the Rio Doce. About 275 miles of the line has been constructed, but the greater part of this will probably need reconstruction since it was not originally planned to make this an ore carrying road.

In connection with the rapid development of the district it may be of interest to note that previous to 1910 most of the iron ore deposits were in the hands of Brazilian owners, many of whom were descendants of persons to whom the original land grants were given more than 100 years ago for purposes of gold mining, while a few deposits were owned by the goldmining companies operating in the district.

At the present time the principal deposits in the eastern part of the district, that is, in the part tributary to the Victoria to Minas Railway, are controlled by English, French and German interests, who have done extensive exploration and development work. In the western part of the district some deposits are in the hands of Brazilians, as are also a few minor deposits in the eastern part, but here foreign interests, including the German, have made extensive purchases as well and have done much development work. It is from this part of the district that small shipments of ore are expected to be made in 1915.

A serious difficulty to be contended with in extensive mining operations in Brazil, is that of labor. The wages are low, ranging from about 75c to $1.25 per day for ordinary labor and about twice as much for skilled labor, but the difficulty is not only in obtaining laborers, but in keeping them. The gold mines in the district are in constant difficulty in this respect, and unsuccessful attempts have been made to import Spanish labor, while recently one of the mining companies imported a number of Japanese laborers. The native Brazilian laborer is averse to working underground and prefers agricultural work with lower wages to mining work.

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Our large modern plant, consisting of a foundry 160 x 80 feet; machine shop 400 x 80 feet, and a large pattern shop, complete in every detail, enables us to turn out promptly and at the lowest price anything in Converter Steel Castings up to 2500 pounds, and in gray iron up to 10 tons.
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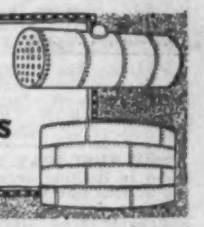

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Specialties → Blued and Polished Steel, Deep Drawing Steel, Automobile Sheets, Full Finished Enameling and Ceiling Stock, Etc.

Opportunities

Men Wanted
Minimum, 50 words, $1.00. Each additional word, 2c. All capitals, 50 words, $1.50. Each additional word, 3c.

Position Wanted
Minimum, 25 words, 50c. Each additional word, 2c. All capitals, 25 words, 75c. Each additional word, 3c.

Miscellaneous Classified
Minimum, 25 words, $1.00. Each additional word, 4c. All capitals, 25 words, $2.00. Each additional word, 8c.

Men Wanted

UNDERSIGNED COUNSEL WILL CONFIDENTIALLY negotiate preliminaries for important executive, technical, administrative and professional positions, insuring strictest privacy. Not an agency, but a highly-endorsed, high grade method of negotiating preliminaries only, for $3,000 to $12,000 men. Send address only for explanation. R. W. Bixby, Lock Box 134-E9, Buffalo, N. Y.

WANTED:—COMPETENT AND EXPErienced traveling salesman for Alloy Steels. Address Box 249, THE IRON TRADE REVIEW, Cleveland, O.

WANTED:—FIRST CLASS FOREMAN for steel foundry. Must have all around experience, including molding machines, and be strictly sober. State experience and salary expected. Address Box 251, THE IRON TRADE REVIEW, Cleveland, O.

WANTED:—SALESMAN CALLING ON hardware, mill and power house trade to handle a high grade article on liberal commission. Address Box 252, THE IRON TRADE REVIEW, Cleveland, O.

WANTED—SUPERINTENDENT FOR plant manufacturing plumber's cast iron enambled ware; no enamel recipe required; will entertain applicant not experienced in this line, if he has been successful superintendent or manager of some manufacturing concern, preferably having gray iron foundry; want disciplinarian and organizer strong on routine to assure prompt and correct shipments, keep up quality and improve organization; reasonable wages to start with but good proposition if he gets operations going satisfactorily. Answer, giving full particulars, to Box 255, THE IRON TRADE REVIEW, Cleveland, O.

GUIDE MILL ROLLER WANTED ON ten inch mill in California; give references and full account of experience. Address Box 260, THE IRON TRADE REVIEW, Cleveland, O.

THE BEST WAY TO GET A GOOD POsition in drafting or engineering is to file an application direct with some of our clients who are depending on us to get competent and experienced applicants for their vacant positions. Send stamp for blank and list of vacant positions. The Cleveland Engineering Agency Co., Rose building, Cleveland, O.

Positions Wanted

POSITION AS FOREMAN PATTERN maker; sixteen years' experience; over seven years as jobbing shop foreman. If you are looking for a hustler with ability, I invite correspondence. Address Box 140, THE IRON TRADE REVIEW, Cleveland, O.

BLAST FURNACE SUPERINTENDENT or manager; merchant or steel works furnaces. Wide experience organizing, operating and managing. Technical graduate. Know how to combine quality, quantity, low cost. Address Box 228, THE IRON TRADE REVIEW, Cleveland, O.

BUSINESS AND MECHANICAL EXECUTIVE.

If a DIRECTOR or large STOCK HOLDER in a manufacturing business, that has possibilities but not giving proper returns, your correspondence solicited. Will accept the MANAGEMENT or act in ADVISORY capacity if satisfactory results can be accomplished. My field has been broad; construction of plant, designing of product, selecting equipment, installing shop methods, purchasing, accounting, sales, perfecting management and financing. Successful results in putting several concerns in the profit column and establishing efficient organizations throughout. Your correspondence treated confidential and may mean turning point in your business. Address Box 246, THE IRON TRADE REVIEW, Cleveland, O.

SUPERINTENDENT: STEEL WORKS and rolling mills, graduate chemist and practical metallurgist, with 20 years' experience in the production and rolling of steel desires to make a change. Address Box 231, THE IRON TRADE REVIEW, Cleveland, O.

WANTED—POSITION IN COREROOM as foreman; 22 years' experience, 10 years as foreman in gray iron, steel and malleable; references, if required. Address Box 239, THE IRON TRADE REVIEW, Cleveland.

EXPERIENCED PATTERN MAKER wishes position as foreman; over 10 years in charge of shops employing from 20 to 100 men making patterns for gas and oil engines and electrical machinery. Broad experience with molding machines. Address Box 253, THE IRON TRADE REVIEW, Cleveland.

OFFICE MANAGER, FACTORY OR cost accountant, 30 years of age with 12 years practical experience, capable to analyze, install or perfect complete factory system. Highest testimonials. Address Box 254, THE IRON TRADE REVIEW, Cleveland, O.

GENERAL SUPERINTENDENT OF blast furnace and coke oven plant, 1,000,000 tons pig iron capacity, and manager of fabricating shop, 60,000 tons capacity, good organizer of men and efficiency methods, low cost records, 20 years' practical experience in designing, erecting and operating desires to connect with firm on salary and bonus basis. Best of references. Address Box 257, THE IRON TRADE REVIEW, Cleveland, O.

SUPERINTENDENT; PRACTICAL EXecutive, broad experience stamping, drawing, forming, sheet metals with ability to make installments and operate after installation; has article of merit, (appeals to farmers) which would greatly increase tonnage for sheet mills. Address Box 258, THE IRON TRADE REVIEW, Cleveland, O.

POSITION WANTED BY EXPERIENCED master mechanic familiar with rolling mill, blast furnace and steel plant work; have more than twelve (12) years' experience in charge of the above lines of work and am thoroughly familiar with it and the management of help; open for engagement to take charge November 1st, 1914; prefer a position somewhere in N. Y. state or Ohio. Address Box 261, THE IRON TRADE REVIEW, Cleveland, O.

SOUTH AMERICA

Glenville A. Collins, Civil and Mining Engineer, familiar with Latin Americas and methods; experienced in export trade and machinery, wants connections with firm desiring to exploit S. A. trade. Address Box 144, Seattle, U. S. A.

YOUNG MAN DESIRES POSITION with steel concern; has had twelve years' experience in office and selling end with one of the largest concerns in the country. Address Box 262, THE IRON TRADE REVIEW, Cleveland, O.

SALESMAN, EXPERIENCED ON GALvanized and black sheets, tinplate, etc., with established trade in New York City desires to represent reliable manufacturer in Metropolitan district; commission basis. Address Box 263, THE IRON TRADE REVIEW, Cleveland, O.

EMPLOYERS DESIRING TO INCREASE efficiency in office, shop or factory, will be able to make known this fact to better advantage by placing a classified ad in THE IRON TRADE REVIEW than through any other means.

Sales Agents

SALESMAN DESIRES ALLOY STEEL account for Michigan territory. Address Box 256, THE IRON TRADE REVIEW, Cleveland, O.

Wanted

WANTED—ONE COPY EACH OF JULY 11 and July 18, 1912, and index to volume 52. For each copy of any of the copies of the above returned to us we will extend the sender's subscription for three months. Address Circulation Department, THE IRON TRADE REVIEW, Cleveland, O.

PUNCH PRESS WANTED, SECOND hand or new; must be equal in size to a No. 5 Feracute. Address Letz Mfg. Co., Crown Point, Ind.

WANTED—COPIES OF THE IRON TRADE REVIEW of January 2nd, 1913. For each copy of this issue returned to us we will extend the subscription of the sender for three months. Address Circulation Department, THE IRON TRADE REVIEW, Cleveland, Ohio.

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